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ABSTRACT

Activities are reviewed of a project to provide planning information for high school vocational agriculture programs in Indiana and to develop a procedural model for conducting employment needs assessments in agriculture. An introductory chapter presents the purpose, the objectives of the needs assessment, and the rationale for developing the model. Development of the procedural model is described in chapter 2, and the specific results of the model tests are presented along with a listing of its critical aspects. Major findings presented are the following: (1) The procedural model based upon a random sample of agribusinesses did provide access to agribusiness employment data and (2) model validation tests indicated that the stratification procedures used did contribute to the selection of a representative random sample of agribusinesses. Chapter 3 reports the agribusiness employment needs by vocational agriculture program areas. Results portray anticipated employment hiring in each of the nonfarm business areas of agriculture. Recommendations for planning Indiana vocational programs presented in chapter 4 include major program emphasis on preparation of workers for production agriculture, agricultural supplies and services, agricultural mechanics, agricultural products, and ornamental horticulture. Appendixes contain a list of agribusinesses by Standard Industrial Classification code and survey questionnaires and letters used in the project. (BL)

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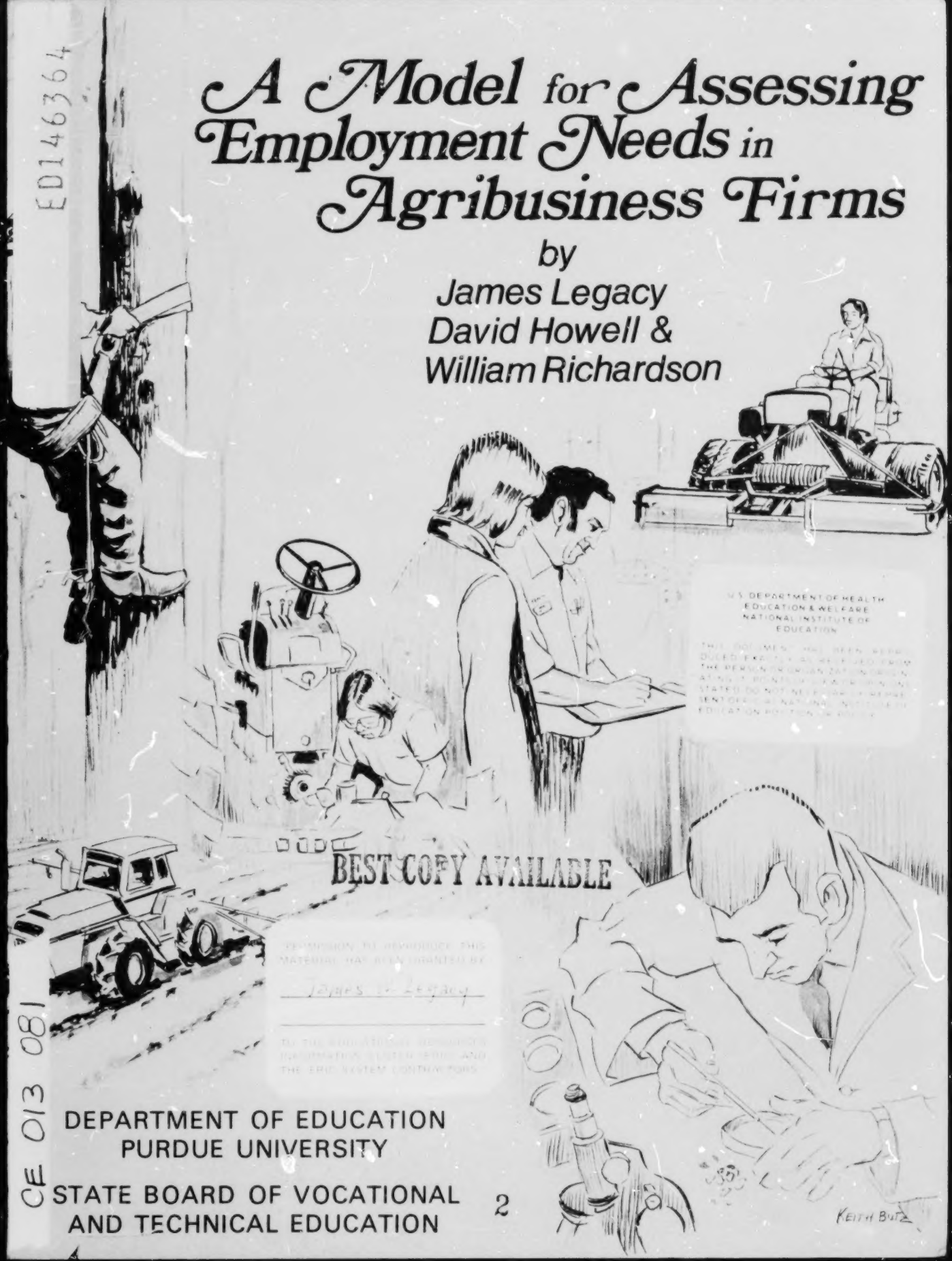
A Model for Assessing Employment Needs in Agribusiness Firms

by
James Legacy
David Howell &
William Richardson



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DEPARTMENT OF EDUCATION
PURDUE UNIVERSITY

STATE BOARD OF VOCATIONAL
AND TECHNICAL EDUCATION

FINAL REPORT

James W. Legacy
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Project No.
13-76-C-9

Agricultural Education Section
Department of Education
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July, 1977

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Appreciation is expressed to the project's steering committee members and to the 14 county task force groups. Thanks are also due to the research staff of the Indiana Employment Security Office, Research Division. Finally, the responses of 352 agribusinesses who facilitated completion of the project are acknowledged with sincere appreciation.

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Preface

In July 1976, the Agricultural Education Staff of the Department of Education at Purdue University began a study of the employment needs of Indiana's production agriculture and agribusiness.

The project which was funded by the State Board of Vocational and Technical Education provided: (1) planning information for vocational agriculture programs and (2) a procedural model for conducting employment needs assessments in agriculture. These results are being published in two reports. The first report, titled "A Model for Employment Needs Assessment in Agribusiness," is accompanied by a publication titled, "Agribusiness Employment Needs in Indiana." The primary purpose of the employment needs information is to provide job opportunity data for persons who are planning and conducting Indiana Vocational Agriculture programs. The procedural model presents the methods and research tests used to validate the steps which are necessary to develop reliable employment needs projections. The reasons for reporting the model were to provide a basis for confidence in the study's findings and to facilitate replication of the study.

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CHAPTER I

Introduction

One of the most important aspects of vocational education programs is that the training provided leads to job placement. It is necessary for those persons who are planning and conducting vocational programs to consider the employment needs of industry.

New technology and increasingly urban living patterns are affecting employment in Indiana's agribusinesses. The impact of these trends is: First, the number of persons employed full-time on Indiana farms has decreased; and second, a varied and expanding non-farm agricultural industry is developing.

All businesses providing inputs of production, processing and distribution of agricultural products are defined as agribusinesses[1]. The production of food and fiber has evolved from a primarily self sufficient production agriculture to a highly mechanized and specialized industry which requires an increasing amount of input and output services. Today's farmer may have his cows bred by a specialist, have soil tested in a laboratory and his farm business records analyzed by a computer. Processing and distribution of farm products may involve processing

---

[1] Davis, John H. and Ray A. Goldberg. A Concept of Agribusiness. Harvard Business School, Division of Research, Boston, 1957, p.2.

a single farm product into several forms for consumer use. Controlled storage now makes seasonal crops such as strawberries available on a year round basis. Consumer demand for conveniently packaged and ready to serve foods has further increased the need for processing and distribution services.

The Need for Trained Workers in Agribusiness

The increased technology of agribusiness has demanded a corresponding increase in the training level of agribusiness workers. At the same time, the rapidly growing array of businesses and industries providing supply, production, processing and distribution services to agricultural production has required trained workers to be available in increasing numbers.

To meet the employment needs of new and expanding agribusinesses, vocational education in agriculture has developed specialized vocational education programs in agriculture. Today, the United States Office of Education recognizes eight speciality areas of vocational education in agriculture[2].

In Indiana, specialization in vocational agriculture is in a developmental phase. Vocational agriculture programs in horticulture are new and expanding, programs in agricultural mechanics, natural resources, and agricultural business are

[2] The eight USOE programs for agriculture are: Agricultural production, agricultural supplies and services, agricultural mechanics, agricultural products, ornamental horticulture, forestry, natural resources, and other agribusiness.

being planned at the local level.

Within this developmental process, the state agency responsible for vocational program planning needs accurate employment data. In Indiana, the State Board for Vocational and Technical Education compares employment supply and demand information in its annual state plan. The current state plan for vocational agricultural education in Indiana is based on incomplete data. The 1977 plan notes, "Available data does not accurately project expansion and replacement needs in the area of agriculture."(3)

Rational for Developing the Model

Employment need studies of agribusiness industries have followed the development of specialized vocational programs in agriculture. Non or off farm vocational programs in agriculture were developed following the 1963 vocational education legislation. During the mid 1960's, agricultural educators performed task and job analysis of non-farm agricultural occupations. These projects provided the basis for specialized vocational programs in agriculture. Several states now provide high school preparation in as many as seven and ten specialized training areas of vocational agriculture. In 1968, new vocational legislation called for employment needs assessments to support funded vocational programs. The 1976 vocational act calls for employment needs data based on standard employment classifications and statistically sound procedures.

(3) The Indiana State Plan for Vocational Education, Fiscal Year 1977, The State Board for Vocational and Technical Education. Page 61.

During the years following the 1968 vocational education act amendments, many states have conducted surveys of agribusiness employment needs. There is currently a national assessment of agribusinesses' employment. The national project will not be completed for several years. Most of the past state projects were based on as many businesses' responses as could be collected. These studies were based on a selected group of agribusinesses. The most common approach taken was to ask local teachers of agriculture to obtain as much employment data as they could within their local school districts. This data was then compiled and developed into statewide planning information. The reason for using non-random samples is that researchers could not obtain a total listing of agribusinesses on a statewide basis. There are several problems with using non-random data:

1) The data collected is representative only of the employment needs of the businesses sampled.

2) Projections to the total population of agribusinesses is based upon the assumption that the selected sample is a random sample.

3) Allowances or adjustments must be made for the bias created by multiple data collectors.

4) Personal interviews consume costly resources of time and money.

To overcome the problems with making projections based on a selected sampling technique and the error attributed to teacher collection of employment data, this study attempted to determine the total population of agribusinesses.

Once the total population of agribusinesses was determined, random sample results provided a basis for projection of state wide employment needs. Obtaining a total business population of non-agricultural industries is a fairly easy process: Employment Security maintains lists of businesses according to the Standard Industrial Classification Code classification system. Until recently, many agricultural businesses have been exempt from reporting employment to this agency.

Because of a recent requirement to report agricultural employment, the Standard Industrial Classification Coding System has been redone. It now contains more than 80 agribusiness areas.[4] With this new source of data at hand, this project proceeded to develop a stratified and random sampling procedure for projecting employment needs in agribusinesses.

Purpose of the Project

The purpose of the research was two fold. The first purpose was to provide current and projections of employment needs in the business areas of non-production and production agriculture. The second purpose of the study was to design and test a procedural model for determining employment needs

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[4] Office of Statistical Standards, Standard Industrial Classification Manual, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 1971.

in agribusiness which utilizes a random sampling procedure.

Background to the Problem

Agricultural educators in Indiana are very much aware of the rapid technological changes that are taking place in the agricultural sector of Indiana's economy. This change has given vocational programs in agriculture new direction. The number of people actively engaged in full-time farming has decreased, while the production of food and fiber has increased. There are a multitude of new and changing agri-related occupations which require new and highly skilled persons in occupations directly related to production agriculture.

In 1969, the director of resident instruction at the University of Arizona, College of Agriculture, reported that six workers are needed for every worker on the farm. These jobs in agribusiness are necessary to maintain the productive capacity of the American farmer. There needs to be a determination of what the present and future employment needs in production and non-production agricultural businesses are. This determination is necessary if the vocational agricultural programs in the State of Indiana are to continue to meet the needs of agriculture.

There have been a number of manpower studies conducted recently in different states.

Agan[5] reported that 41.59 percent of the employees

[5] Agan, R.J. "Kansas Studies Agriculture Nonfarm Occupations," Agricultural Education Magazine, 37:15-16. July, 1964.

needed in the next five years in Kansas would be the result of anticipated growth. Barwich[6] was interested in the identification of off-farm agricultural occupations in Delaware and the education needed for employment in these occupations. He found that approximately 29 percent of the state's labor force was in agri-related employment, excluding farmers. He reported that 3.1 percent of the total number of employed workers in the state, excluding farmers, need training in agriculture. Barwich's research also indicated that the number of workers needing agricultural competencies would increase by 17.1 percent over the next five years.

Brum, in his work in Ohio, identified 57 different kinds of non-farm agricultural firms. He found a need for 165,262 non-farm agriculture workers who need agricultural competencies in order to be productive workers. He also determined there was a need for 15,890 workers for annual replacement. Brum found that 90 percent of the workers were at the sales, skilled and semiskilled and service levels.[7]

Loreen,[8] studying Washington's agricultural employment

(6) Barwich, Ralph P. Identification of Off-Farm Agriculture Occupations and the Education Needed for Employment in These Occupations in Delaware. Doctor's Thesis. University Park, Pennsylvania State University, 1965. 195 pages.

(7) Brum, Herbert Duane. Non-Farm Agriculture Employment Opportunities and Training Needs in Ohio. Doctor's Thesis. Columbus: The Ohio State University, 1965.

(8) Loreen, C.O. Occupational Opportunities and Training Needs of Youth for Non-Farm Agricultural Jobs in Washington State. Staff Study. Pullman: Department of Agricultural Education, Washington State University, 1967.

needs, projected a 10 percent increase in the number of employees who would need agricultural competencies in the next five years. The researcher concluded that the greatest number of trained employees would be needed in the farm supplies and equipment sales, farm machinery sales and service and in ornamental horticulture occupations.

The overall review of related research and literature indicated that: (1) the need for agri-business employees will continue to increase as agriculture strives to meet the new demand for food and fiber, (2) in the future, employees in agri-business positions will need to be more specialized, (3) agricultural background will continue to be an asset to most agri-business employees.

The tenor of the recommendations made by researchers seemed to indicate that individual states will need to continue to conduct statewide manpower studies because of the variety of unique situations within individual states. Also that such research should be conducted on a regular basis in order to maintain current employment data suitable for recognizing old programs as well as planning and implementing new ones.

Objectives of the Needs Assessment Project

The specific objectives of this project are as follows:

1) identify the types of businesses which employ workers at the entry level who are required to have had agricultural experience. These businesses would be in the areas of agricultural production, agricultural supplies, agricultural mechanics,

agricultural products, ornamental horticulture, agricultural resources, and forestry.

2) Identify the number of employees needed to fill entry level positions as replacements in agriculture related business who are required to have had agricultural experience.

3) Identify the number of employees needed to fill entry level positions because of expansion by agriculture related businesses.

4) Design and test a random sampling procedure for gathering employment needs data for agribusiness. The development of this model will facilitate future employment needs assessments.

5) The procedure designed will meet the 1976 vocational acts requirement for employment needs data based on standard classifications and statistically sound procedures.

CHAPTER II

THE PROCEDURAL MODEL

Introduction

A review of past agribusiness employment projects indicated that an agribusiness employment needs assessment based upon state employment office data will be unique. The purpose of this chapter is to develop a procedural model. It should be kept in mind that the specific results and tables of the employment needs assessment presented in the chapter are used to evaluate the model and not to report employment needs data.

Planning Using the PERT Technique

The Program Evaluation and Review Technique (PERT)[1] was used to plot the necessary activities of the project. This technique was most helpful in anticipating project needs. The PERT chart used during the employment needs assessment project is presented as Figure 1. Figure 1 serves as an illustration of the application of the PERT technique and as a guide to the major steps of the project.

Defining and Sampling the Population

Identifying the Population

The business areas included in the project's population

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(1) Cook, Desmond L. Program Evaluation and Review Technique Applications in Education. U.S. Department of Health, Education and Welfare, Office of Education, Washington, D.C., 1966. 100 pages.

FIGURE 1

TIME LINE FOR EMPLOYMENT NEEDS SURVEY

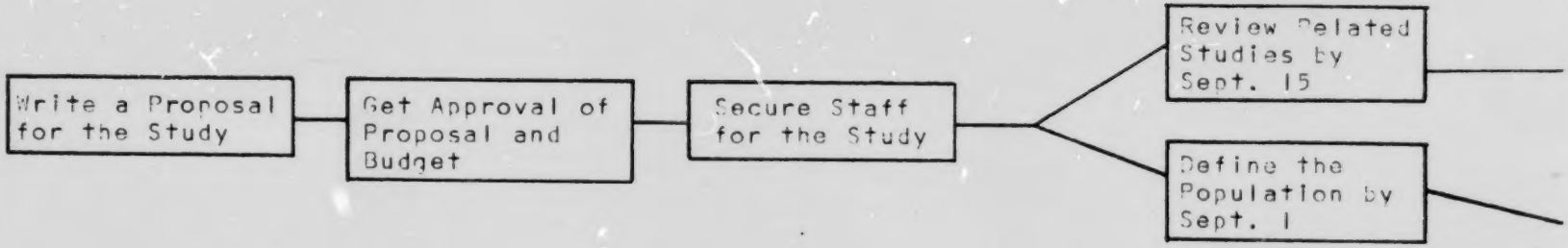

Write a Proposal for the Study
Get Approval of Proposal and Budget
Secure Staff for the Study
Review Related Studies by Sept. 15
Define the Population by Sept. 1

FIGURE 1 (Continued)

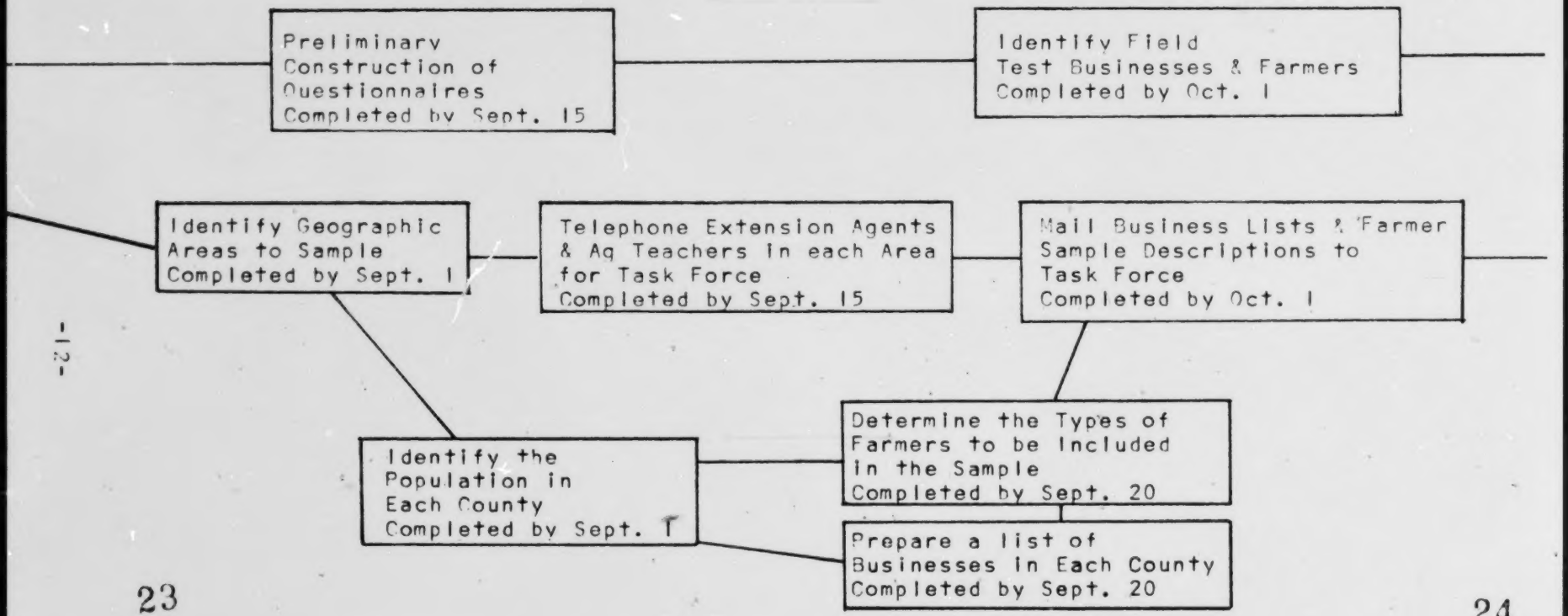

Preliminary Construction of Questionnaires Completed by Sept. 15
Identify Field Test Businesses & Farmers Completed by Oct. 1
Identify Geographic Areas to Sample Completed by Sept. 1
Telephone Extension Agents & Ag Teachers in each Area for Task Force Completed by Sept. 15
Mail Business Lists & Farmer Sample Descriptions to Task Force Completed by Oct. 1
Determine the Types of Farmers to be Included in the Sample Completed by Sept. 20
Identify the Population in Each County Completed by Sept. 1
Prepare a list of Businesses in Each County Completed by Sept. 20

FIGURE 1 (Continued)

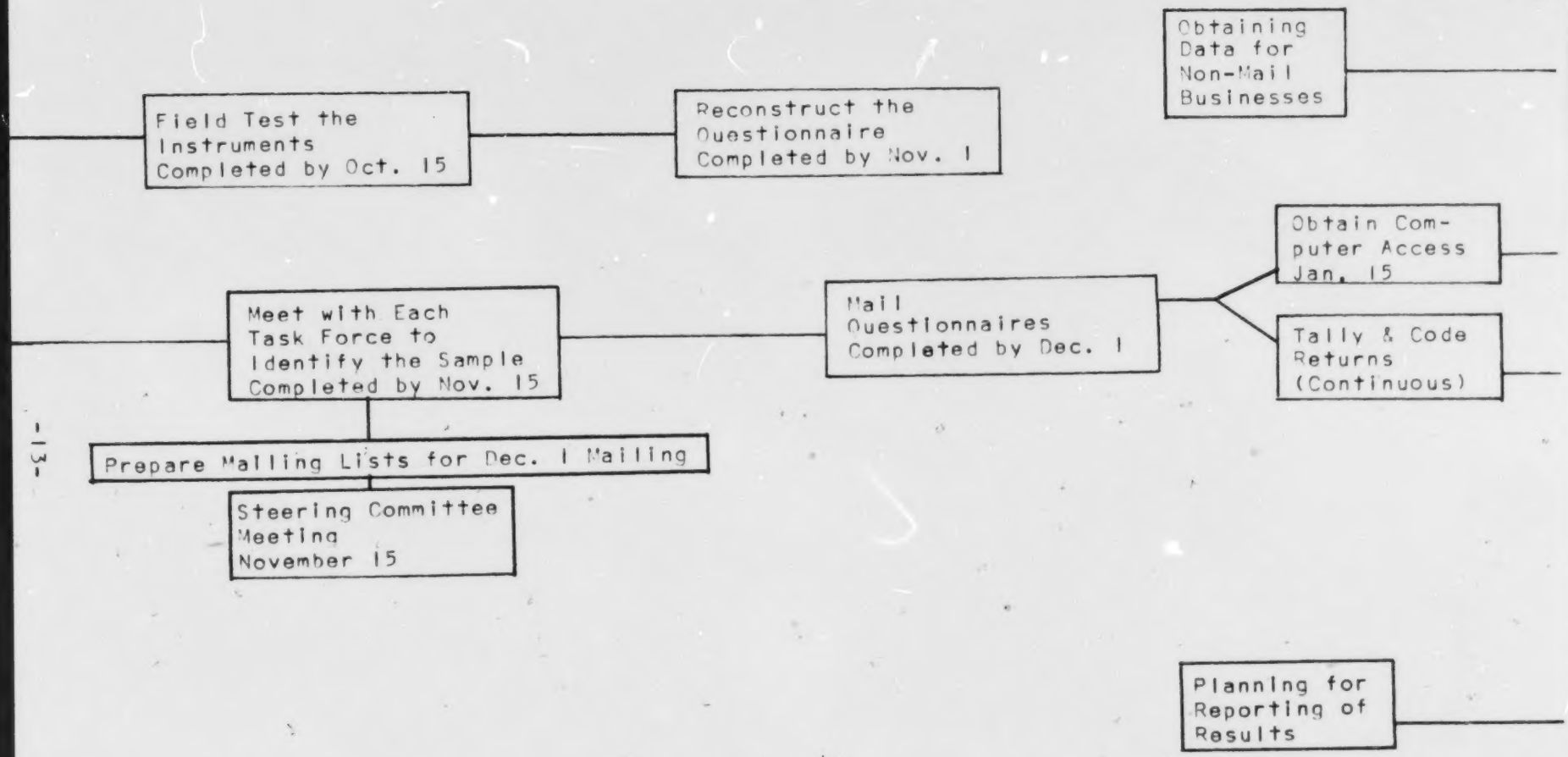
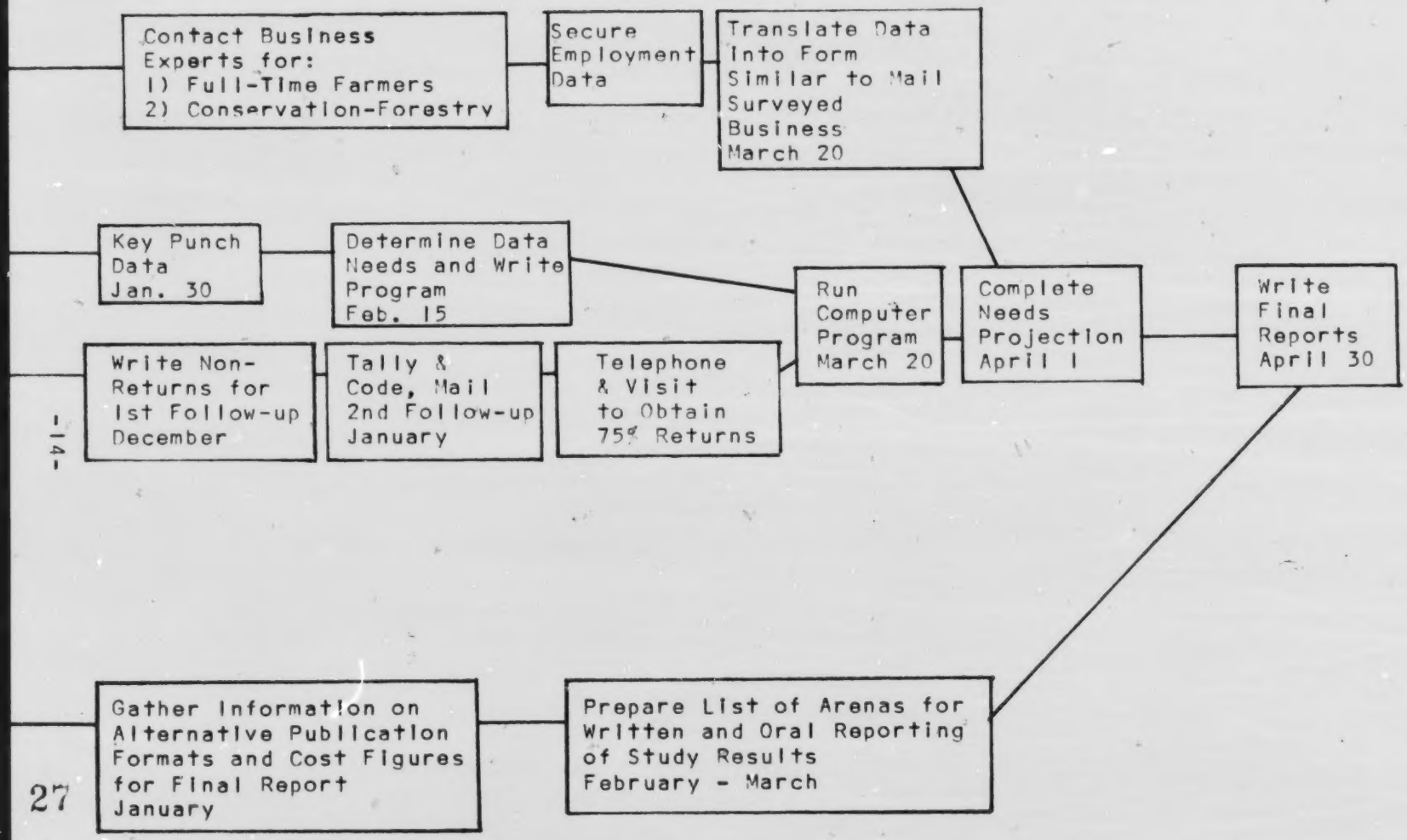

Obtaining Data for Non-Mail Businesses
Field Test the Instruments Completed by Oct. 15
Reconstruct the Questionnaire Completed by Nov. 1
Obtain Computer Access Jan. 15
Meet with Each Task Force to Identify the Sample Completed by Nov. 15
Mail Questionnaires Completed by Dec. 1
Tally & Code Returns (Continuous)
Prepare Mailing Lists for Dec. 1 Mailing
Steering Committee Meeting November 15
Planning for Reporting of Results

FIGURE I (Continued)


Contact Business Experts for: 1) Full-Time Farmers 2) Conservation-Forestry
Secure Employment Data
Translate Data into Form Similar to Mail Surveyed Business March 20
Key Punch Data Jan. 30
Determine Data Needs and Write Program Feb. 15
Run Computer Program March 20
Complete Needs Projection April 1
Write Final Reports April 30
Write Non-Returns for 1st Follow-up December
Tally & Code, Mail 2nd Follow-up January
Telephone & Visit to Obtain 75% Returns
Gather Information on Alternative Publication Formats and Cost Figures for Final Report January
Prepare List of Arenas for Written and Oral Reporting of Study Results February - March

were those businesses whose employment needs coincided with the activities of the agribusiness education program areas recognized by the United States Office of Education. The USOE agribusiness program areas are agricultural production, agricultural mechanics, ornamental horticulture, agricultural supplies and services, forestry, agricultural products, and agricultural resources.

A review of the Standard Industrial Classification (SIC) Code Manual[1] provided a list of business areas and codes which are used to classify agricultural businesses. This list is attached as Appendix A. The Indiana Employment Security Office[2] compiles quarterly information from businesses who employ workers. This information, after wavier of disclosure laws (see letter Appendix B), identified many of Indiana's agribusinesses and provided employment numbers data.

Stratification of the Population

Agribusinesses located in urban areas may employ a work force with a greater or smaller proportion of agricultural employees, as compared to similar agribusinesses in rural districts. To account for this possible agricultural need variable, Indiana's ninety-two counties were classified as city, urban, suburban, or rural (see Appendix E).

---

(1) Office of Statistical Standards, Standard Industrial Classification Manual, Superintendent of Documents, U.S. Government Printing Offices, Washington, D.C. 1971.

(2) Indiana Employment Security Office, Research Division, Indiana Employment Security Building, Indianapolis, Indiana.

This stratification was determined by the percent of urban population in each county. Table I presents the basis for the county classification system.

TABLE I

CLASSIFYING INDIANA'S COUNTIES AS RURAL, SUBURBAN, URBAN OR CITY

The 92 counties in Indiana were stratified into 4 types according to their proportion of urban population.(1)

Type	Criteria	N	Population in Thousands
City	95-100% urban	2	1138
Urban	60-94% urban	16	1856
Suburban	34-59% urban	31	1110
Rural	0-33% urban	43	889
		92	4993

A second possible employment need variable considered was the effect that the fourteen economic regions of Indiana may have on agribusiness employment needs. A decision was made to select one county from each economic region. Fourteen sample counties were then selected at random. Two city counties, four urban, four suburban and four rural counties were chosen. Stratification by economic region and a demographic characteristic were designed to increase the representativeness of a random sample of agribusiness.

Selecting the Sample of Fourteen Counties

One county from each of Indiana's fourteen economic

(1) Urban population - all persons living in places of 2500 inhabitants or more. Data taken from 1970 census, U.S. Dept. of Commerce, Dept. of Census, 1973, Vol. I Part 16, pg. 16-18, 16-19.

planning regions was selected. The two city counties of Marion (Indianapolis) and Lake (East Chicago) were included in the sample. The population in these two city counties accounts for approximately 25% of Indiana's five million residents.

One county was selected from each of the twelve remaining economic planning regions. Using a random number table, four planning regions were selected to provide rural counties for the sample. The random number table was also used to select four planning regions to provide suburban counties for the sample and four planning regions to provide urban counties for the sample.

A random numbers table identified the following economic planning regions to provide urban counties to the sample: 2, 12, 6, 10; suburban counties to the sample: 3, 11, 5, 3; rural counties to the sample: 4, 9, 7, 14; city counties to the sample: 1,8.

A listing was made by county types; rural, urban, and suburban. Counties from the planning regions to provide urban counties were listed alphabetically. Suburban and rural counties were similarly ordered. Each county was assigned a number. A random number table was used to select one county from each planning region.

Sample counties were presented to the project's steering committee at the September meeting. Four counties were replaced by the project's steering committee. The steering committee recognized that the state's north central farm belt

was not adequately represented. Counties added were from similar population categories as those removed. The new counties also maintained representation from each of Indiana's planning and development regions.

Sample Counties

City	Urban	Suburban	Rural
Lake	Elkhart	Bartholomew	Carroll
Marion	Grant	Cass	Crawford
	Jefferson	Gibson	Rush
	Monroe	Huntington	Vermillion

Figure II, Agribusiness Employment Needs Project County Sample Map, illustrates both the classification of Indiana counties and the location of the fourteen sample counties. Figure III is a map which illustrates the fourteen economic planning regions of Indiana. Figure III also indicates the location of the fourteen sample counties.

Selecting the Sample of 365 Non-farm Agribusinesses

A preliminary list of agribusinesses was obtained for each of the fourteen sample counties. The preliminary list was provided by the Indiana Employment Security Office, Research Division. In each county, a task force committee consisting of teachers of agriculture, agricultural extension agents, agribusiness representatives and farmers was created. Project staff members met with the task force committees to make corrections to the preliminary agribusiness lists. Table II reports the final number of agribusinesses identified in each county. The county task force additions increased the Employment Security Office's number of agribusinesses

FIGURE 11

AGRIBUSINESS EMPLOYMENT NEEDS PROJECT COUNTY SAMPLE MAP

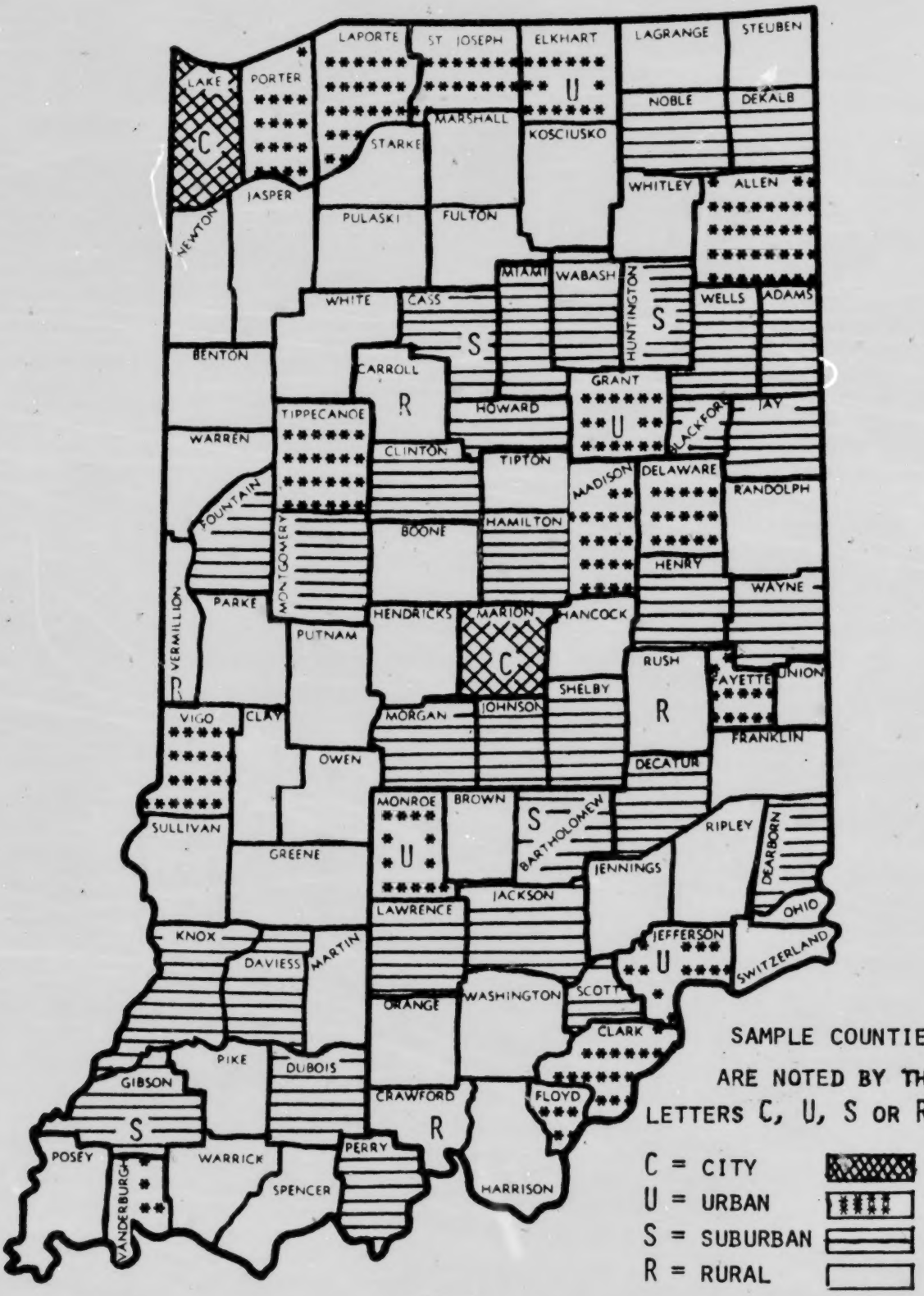
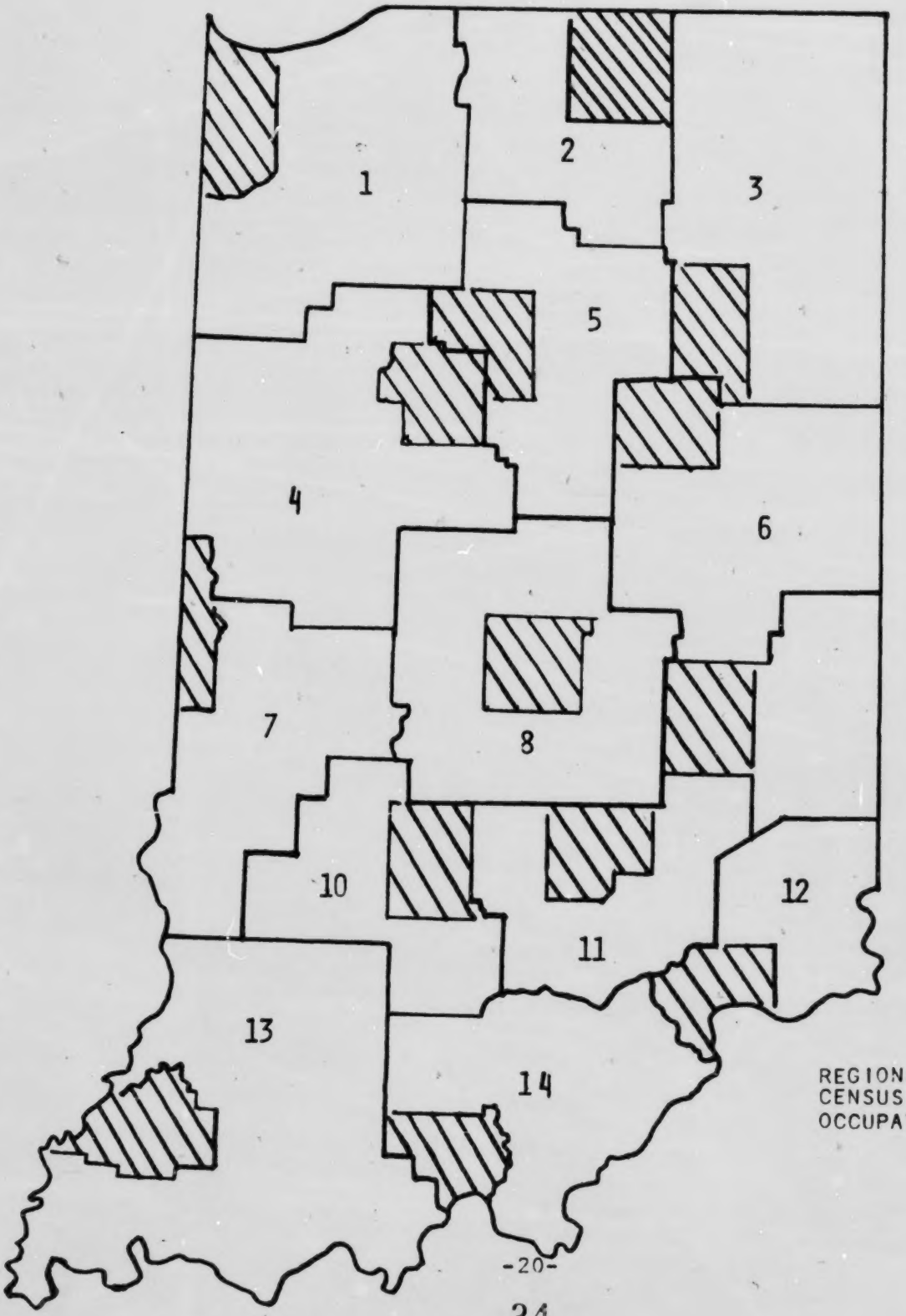


FIGURE III

ECONOMIC PLANNING AND DEVELOPMENT REGIONS
STATE OF INDIANA



REGIONS FOR THE 197
CENSUS INDUSTRY -
OCCUPATIONAL DATA

TABLE II

NUMBER OF AGRIBUSINESSES IN A SAMPLE OF 14 INDIANA COUNTIES

	Agricultural Supplies & Services	Agricultural Mechanics	Ornamental Horticulture	Agricultural Products	Forestry	Agricultural Resources	Farms
Bartholomew	12	4	11	31	16	2	1027
Carroll	34	10	5	15	7	2	1098
Cass	25	14	6	33	18	2	1272
Crawford	3	1	1	4	20	0	543
Elkhart	35	16	47	79	70	7	1926
Gibson	20	6	10	19	16	2	1219
Grant	19	12	14	39	27	6	1262
Huntington	21	7	8	20	19	3	1301
Jefferson	11	4	2	26	9	1	1316
Lake	40	11	72	268	85	12	878
Marion	55	19	164	423	135	14	695
Monroe	9	1	21	43	6	1	592
Rush	30	11	5	14	12	0	1131
Vermillion	11	5	4	12	6	0	472
Business Area TOTALS	325	121	370	1026	446	52	14,734

by 7½ %. A random selection by county of 10% or a minimum of two businesses from each vocational agribusiness education program area identified a sample of 365 agribusinesses.

Selecting a Sample of Indiana Farmers

Full-time farmers and farm worker data is collected quarterly by the Indiana Crop and Livestock Annual Summary[1]. A farm census is taken nationally each five years. With adequate full-time farm employment data, the project staff and steering committee decided to utilize the existing data sources to project full-time farm employment needs. One of the trends occurring in Indiana farm labor needs was investigated by this project. The trend toward more part-time farmers was investigated. Thirteen county task force committees identified a sample of 104 part-time Indiana farmers. The questions to be answered by the part-time farmer survey is: How productive are part-time farmers and what are the labor needs of Indiana's part-time farmers?

Construction of Data Collection Instruments

Two questionnaires were developed. One questionnaire was used to obtain current, past and future agribusiness employment data from the sample of non-farm agribusiness.

---

[1] Indiana Crop and Livestock Statistics, Annual Crop and Livestock Summary, 1975. United States Department of Agriculture, Washington, D.C.

A farm questionnaire was developed to determine the productive enterprises and labor needs of the sample of 104 Indiana part-time farmers. The questionnaires were field tested by personal interviews and by mail. The final form of the data collection instruments are presented in Appendix C.

Data Collection

In early December, 469 questionnaires were mailed. This date was selected to prevent conflicts with the seasonal busy times on farms and in agribusinesses. By February first, three follow-up mailings had produced a 73% response rate of usable returns. Techniques used to increase business responses included weekend mailing dates, colored paper for the instruments, a token gift, and letters signed by the local county task force committee. A stratified 10% non-respondent follow-up was conducted by telephone. The results of the non-respondent follow-up eliminated the project staff's concern with non-respondent bias. The data collected by telephone did not vary from the kind of employment data returned by mail.

Testing the Procedural Model

Statistical comparisons were made to determine if the business population stratification procedures of the model were necessary. The measure of variance used to determine populations within or among stratified groups was the proportion of business employees required to have agricultural

experience. Employment data collected from county groups created by the demographic classification of counties suggested that among county groups, agribusinesses hired work forces requiring significantly different proportions of agricultural workers. This result demonstrates the need for demographic stratification when random samples of agribusinesses are used to determine employment needs. Table III reports the number of employees observed and expected to need agricultural experience in urban, city, rural and suburban counties.

A similar comparison procedure was used to determine the need to stratify the population of agribusinesses by economic planning regions. Table IV reports that among the fourteen economic regions the observed number of agricultural employees varied significantly from the expected number. This result demonstrates the need for economic region stratification when random samples of agribusinesses are used to determine agribusiness employment needs.

The project's 10% sample of agribusinesses was taken from a population which was stratified by USOE program areas. A comparison of the proportion of agribusiness employees who need agricultural experiences among business groups is reported in Table V. Table V indicates that stratification of businesses by type is a necessary component to the selection of a representative sample of

TABLE III

COMPARISON OF CITY, URBAN AND SUBURBAN, RURAL AGRIBUSINESSES' MEAN PROPORTION OF AGRICULTURE EMPLOYEES

County Type	Number of Businesses	Mean Population of Ag Employees	Deviation
City & Urban	143	.4353	.619
Suburban & Rural	103	.6489	.758

F Value	T Value	Degrees of Freedom	2-tail Probability
1.50 (significant at .05)	-2.43	244	.016

The results of Table III suggest that suburban and rural agribusinesses require a greater proportion of their workers to have agricultural experience than do city and urban agribusinesses.

TABLE IV

COMPARISON OF AGRICULTURAL EMPLOYEE NEEDS BY ECONOMIC REGION

Economic Planning Region	Number of Sample Employees	Expected Ag Employees	Observed Ag Employees	x^2 Contribution
1 city	1290	77	95	3.32
2 urban	293	135	130	.19
3 suburban	227	194	196	.02
4 rural	115	75	67	.85
5 suburban	227	194	184	.52
6 urban	4647(147)	68	99(49)	5.31
7 rural	65	43	29	4.56
8 city	5565	333	305	2.35
9 rural	136	89	112	5.94
10 urban	114	92	90	.04
11 suburban	205	175	183	.37
12 urban	121	55	56	.02
13 suburban	126	108	107	.02
14 rural	13	8	8	.00
			x^2 =	23.51
		x^2 needed to determine significance at .05	=	23.685

TABLE V

COMPARISON OF AGRICULTURAL EMPLOYEE NEEDS BY BUSINESS AREA

Business Area	No. of Sample Employees	Expected Ag Employees	Observed Ag Employees	x^2 Value
Agricultural Supplies & Services	414	53	402	2298.13
Agricultural Mechanics	253	32	223	1140.03
Agricultural Products	11,432	1,450	510	609.38
Ornamental Horticulture	512	65	326	1048.02
Forestry	482	61	165	177.31
Agricultural Resources	81	10	45	122.5
TOTALS	13,174	1,671	1,671	5395.37

x^2 value needed to determine significance at .05 = 12.592

Indiana agribusinesses.

Agribusiness population stratification by economic regions and by urban demographic characteristics were considered necessary components of obtaining a representative random sample of agribusinesses.

Results of the Procedural Model

The testing of the preliminary model for assessing employment needs resulted in worker demand data which indicated that the model is viable.

The employment needs assessment data provided worker demand information for each of the seven United States Office of Education Vocational Agribusiness Program Areas. This data can be used to plan vocational agricultural programs in Indiana.

The experiences of the researchers while conducting the study led to the conclusion that certain aspects of the model were critical in obtaining optimum results. Although all aspects of the model were necessary, the following list depicts those areas that required the most careful planning and execution.

Critical Aspects of the Model

1. Cooperation from and access to Employment Security information.
2. Design of a questionnaire that collects the desired information and is easily coded for computer work.
3. Development of complete business population lists within the sample counties. The assistance of local task force committees is essential.

4. Population stratification by economic regions and urban demographic characteristics were necessary components of obtaining a representative random sample.

5. Use of a computer program that prints the employment needs data in a form readily transferred to summary pages.

6. Organization of the publication presenting the employment needs data into a form easily read by potential users. It is anticipated that the worker demand data will be used by state, area and local planners of vocational agribusiness education programs.

The second publication of this project, Agribusiness Employment in Indiana, reports the detailed employment information for each vocational agribusiness education program area and gives recommendations for its use. This second publication is intended to be a popularized version of the project's final report. It is anticipated that persons interested in planning vocational agribusiness education programs within Indiana high schools will find the popularized report's format useful.

CHAPTER III

DATA PRESENTATION

INTRODUCTION TO THE DATA PRESENTATION

The data collected from the sample of 336 Indiana Agribusinesses is reported by United States Office of Education program areas. The agricultural mechanics business area is the first to be reported. The data presentation for each business area is made in three parts. Part I presents the past, current, and future total employment for agricultural mechanics businesses in Indiana. Part II reports the number of employees who have been and are projected to be needed to replace retired workers and to provide for business expansion. Part III presents the numbers of employees who need special training in agriculture. Part III, Table X, reports the total number of employees who will need training in agricultural mechanics for each year 1977 through 1981. This table is a summary of data from each specialized business area in agriculture. For example, Table X for the area of agricultural mechanics indicates that the agricultural mechanics industry will need 480 high school level agricultural mechanics in 1981 while the agricultural supplies and services industry will need 115 high school level agricultural mechanics in 1980.

The series of ten tables within each agricultural business area presents the actual sample data and employment need projections on a statewide basis.

The description provided with the agricultural mechanics business data is more detailed than the descriptions of the remaining business areas. Although the verbage is condensed, each business area description was completed with the same analysis procedure and is reported with the same tables I through X as are found in the agricultural mechanics business area description.

EMPLOYMENT NEEDS DATA
FOR
AGRICULTURAL MECHANICS BUSINESSES

I. Determining the total employment in agricultural mechanics businesses

Employment projections are based on:

1) The estimates of future employment made by businesses participating in the study.

2) Current and historical employment data.

3) The trend established from historical present and future data.

The questionnaire used in this study asked each business to "List the total number of persons you expect will be employed in the year 1981." The results of this question were compared to the businesses' current employment. A calculation of difference between these two items provided a measure of the scope of future employment needs. Table I reports that the twenty-three agricultural mechanics businesses, of the sample, employed 253 workers in 1976. In 1981 these businesses projected that they will employ 294 workers.

TABLE I EMPLOYMENT TREND
N = 23

Year	Employment
1976	253
1981	294

Trend = +3.0%

The expansion rate factor of 3.0% is the average annual compound rate which will account for the sample's growth. The same procedure was used on actual 1972 and 1976 employment data to determine a historical employment trend. Table II lists the total employment in Indiana agricultural mechanics businesses during 1972 and 1976. The increase from 9,273 employees in 1972 to 11,298 employees in 1976 represents an annual employment expansion rate of 4.0%.

TABLE II HISTORICAL TREND

Year	Employment
1976	11,298
1972	9,273

Trend = +4.0%

A comparison of the past and future employment trends indicates that the total employment in agricultural mechanics businesses will continue to increase, but at a slower rate.

The next step was to determine the expansion employment needs for each of the five years of projection for the study. The future employment trend of 3.0% is an average growth rate for 1977 through 1981.

If an agricultural business area such as agricultural mechanics historical employment change differed by one percent or more from the projected employment change rate then annual rates were determined which account for the direction of the trend. A formula which considers the trend and scope of employment change was used to determine the employment

projections in Table III. Table III illustrates that the agricultural mechanics businesses in Indiana will need 348 additional employees in 1980 due to expansion alone.

TABLE III PROJECTIONS 1977-81

Year	% Change	Total Employment	Expansion Employment
1977	+3.4	11,682	384
1978	+3.2	12,056	374
1979	+3.0	12,418	362
1980	+2.8	12,766	348
1981	+2.6	13,098	332

The percent change rate from Table III was used as the basis for determining employment projections. Table IV summarizes the projected employment within the major areas of Indiana's agricultural mechanics businesses.

Table IV lists the business groups which exist within each agricultural business area. It also reports the 1972, 1976 and 1981 employment for the major areas of Indiana's agricultural mechanics businesses. This table summarizes the total employment for the agricultural mechanics business area and indicates the average size work force for agricultural mechanics businesses. In 1972 agricultural mechanics businesses employed an average of 8.35 employees, and 8.40 employees in 1976.

TABLE IV

EMPLOYMENT IN AGRICULTURAL MECHANICS BUSINESSES

*Code		1972 Businesses	1972 Employees	1976 Businesses	1976 Employees	1981 Businesses	1981 Employees
3551	Food Product Machinery	22	1002	20	916	18	837
5083(1)	Farm Equipment	642	5235	702	5759	764	6240
5191	Wholesale Farm Equipment and Supplies	446	3036	607	4623	709	6021
Totals Agricultural Mechanics		1110	9273	1329	11298	1491	13098
Average Numbers of Employees per Business			8.35		8.50		8.78

(1) 1972 data for 5083 code was incomplete; 1972 estimate is based on partial data

* Standard Industrial Classification Codes

II. Determining the employment needs of agricultural mechanics businesses

In addition to expansion labor needs, jobs created by retirement and employee turnover were determined.

The study asked each business to report the number of employees who were hired to replace workers. This data was collected for 1971, 1976 and 1981. An average annual replacement employment needs rate was calculated by dividing average 1971, 1976 and 1981 employment by 1971, 1976, and 1981 average replacement workers.

The average annual employee replacement rate for the agricultural mechanics businesses was 14.2%. Industry mobility was determined by applying the state average employee retirement rate (3.64%).[1] The agricultural mechanics business area is projecting to replace 1813 workers in 1980. A within industry worker mobility of 1348 employees indicates that 465 new employees will be needed to replace retirements in 1980.

TABLE V REPLACEMENT EMPLOYMENT

Year	Total Employment	Total Replacement Needs	Industry Mobility	Net Replacemer Needs
1977	11682	1659	1234	425
1978	12056	1712	1273	439
1979	12418	1763	1311	452
1980	12766	1813	1348	465
1981	13098	1860	1383	477

[1] 3.64% is the 1976 average retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

Yearly employment needs were determined by summing net replacement needs and annual expansion. Table VI reports that in 1980 the agricultural mechanics businesses of Indiana will need 348 new employees to replace retiring workers and 465 new employees to allow for planned business expansion. The total need for new workers for agricultural mechanics businesses in 1980 is projected to be 813.

TABLE VI EMPLOYMENT NEEDS

Year	Total Employment	Expansion Employment	Net Replacement Needs	Annual Employment
1977	11682	384	425	809
1978	12056	374	439	813
1979	12418	362	452	814
1980	12766	348	465	813
1981	13098	332	477	809

Table VI reports the projected employment needs for the agricultural mechanics industry. This table shows that due to expansion alone, this industry will hire an additional 332 to 384 employees in each of the next five years. After counting workers to replace retirements, the agricultural supplies and services industry is projected to have an annual employment need of between 809 and 814 workers.

III. Determining agribusiness employee training needs

In addition to projecting the number of agribusiness workers, the study determined the industries' need for employees with agricultural experience at the high school and college level. Specialized agricultural experience data was gathered for seven* of eight vocational agricultural program areas. The United States Office of Education's list of agricultural program areas was used with the exception of production agriculture. Production agriculture employment needs were treated as a separate item and are reported on pages to .

Businesses were asked to list the number of employees who needed agricultural experience in each of the seven non-farm areas of vocational agriculture. Table VII reports the number and percentage of employees in the agricultural mechanics industry who needed agricultural experience at the high school and college level.

TABLE VII EMPLOYEES NEEDING AGRICULTURAL EXPERIENCE

	1976 N = 253	1981 N = 294
High School	198 (78%)	241 (82%)
College	25 (10%)	38 (13%)
Totals	223 (88%)	279 (95%)

Table VII answers the question: How many agricultural mechanics employees need agricultural experience? In 1976 88% of agricultural mechanics employees needed agricultural

*(1) Agricultural Supplies and Services, (2) Agricultural Mechanics, (3) Agricultural Products, (4) Ornamental Horticulture, (5) Agricultural Resources, (6) Forestry, (7) Other Agribusinesses.

experience. In addition to the total number needing agricultural experience, a breakdown of high school and college employees was completed. The 1981 data shows a small shift towards an industry need for a greater percentage of employees who have had agricultural experience.

Next, the study developed a detailed listing of the specialized agricultural experience needs of agricultural mechanics workers. Table VIII reports the specialized experience needs of agricultural mechanics employees.

Table VIII answers the question: What kind of experiences in agriculture do agricultural mechanics employees need? Table VIII is a training need profile for agricultural mechanics businesses. The profile together with the projected total employment need was used to identify the demand for graduates of agricultural personnel preparation programs.

Table VIII reports that in 1976, 49% of agricultural mechanics business employees needed high school level experience in agricultural mechanics. By 1981 24% of the total number of agricultural mechanics business employees will need high school level experiences in agricultural supplies and services.

Table IX lists the specialized preparation and the annual agricultural employment needs of the agricultural mechanics industry.

During the years 1977-1981, agricultural mechanics businesses will need 718 to 736 high school level and

TABLE VIII

EMPLOYEE EXPERIENCE NEEDS

Training Area	Training Level	1976 (N=253)		1981 (N=294)	
Agricultural Supplies and Services	H.S.	63	(25%)	72	(24%)
	College	12	(5%)	17	(6%)
Agricultural Mechanics	H.S.	123	(49%)	153	(52%)
	College	9	(4%)	13	(4%)
Agricultural Products	H.S.	9	(4%)	12	(4%)
	College	3	(1%)	4	(1%)
Ornamental Horticulture	H.S.	1	(1%)	2	(1%)
	College	0	0	0	0
Agricultural Resources	H.S.	0	0	0	0
	College	0	0	0	0
Forestry	H.S.	0	0	2	(1%)
	College	0	0	1	(1%)
Other Agriculture	H.S.	2	(1%)	0	0
	College	1	(1%)	3	(1%)
HIGH SCHOOL TOTALS		198	(78%)	241	(82%)
COLLEGE TOTALS		25	(10%)	38	(13%)
ANNUAL TOTALS		223	(88%)	279	(95%)

TABLE IX

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	190	190	190	190	190
	College	67	67	67	67	67
Agricultural Mechanics	H.S.	488	486	484	482	480
	College	52	52	52	52	52
Agricultural Products	H.S.	43	42	42	42	41
	College	14	16	18	20	22
Ornamental Horticulture	H.S.	11	11	11	11	11
	College	0	0	0	0	0
Agricultural Resources	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Forestry	H.S.	18	18	18	18	18
	College	9	9	9	9	9
Other Agriculture	H.S.	-14	-16	-18	-20	-22
	College	20	20	20	20	20
HIGH SCHOOL TOTALS		736	731	727	723	718
COLLEGE TOTALS		162	164	166	168	170
ANNUAL TOTALS		898	895	893	891	888

approximately 165 college level agricultural workers. Table IX addressed the questions of what kind and how many agricultural employees will be needed by Indiana's agricultural mechanics businesses.

Table IX also reported that forty percent of the agricultural mechanics businesses' employment demand was for personnel with agricultural experiences other than in agricultural mechanics. For example, there was an annual demand for 190 high school level agricultural supplies and service workers and forty-two high school level agricultural products workers.

Table X was developed to provide an estimate of the personnel preparation demand for high school agricultural mechanics. Table X summarized the agricultural mechanics worker needs from each agribusiness industry in Indiana. As reported in Table X, agricultural mechanics businesses will need 480 high school level agricultural mechanics in 1981 while agricultural supply and service businesses will need 115 high school mechanics in 1980.

Table X reports that in 1979, Indiana's agribusiness industry will have an annual demand for 760 high school and sixty-eight college prepared agricultural mechanics workers.

TABLE X

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE
IN AGRICULTURAL MECHANICS

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	109	111	113	115	117
	College	11	11	11	11	11
Agricultural Mechanics	H.S.	488	486	484	482	480
	College	52	52	52	52	52
Agricultural Products	H.S.	14	14	14	14	14
	College	0	0	0	0	0
Ornamental Horticulture	H.S.	11	11	11	11	11
	College	0	0	0	0	0
Agricultural Resources	H.S.	2	2	3	3	3
	College	0	0	0	0	0
Forestry	H.S.	133	134	135	137	138
	College	5	5	5	5	5
HIGH SCHOOL TOTALS		757	758	760	762	763
COLLEGE TOTALS		68	68	68	68	68
ANNUAL TOTALS		825	826	828	830	831

EMPLOYMENT NEEDS DATA
FOR
AGRICULTURAL SUPPLIES AND SERVICES BUSINESSES

I. Determining the total employment in agricultural supplies and services businesses

Employment projections are based on:

1) The estimates of future employment made by businesses participating in the study.

2) Current and historical employment data.

3) The trend established from historical present and future data.

The questionnaire used in this study asked each business to "List the total number of persons you expect will be employed in the year 1981." The results of this question were compared to the businesses' current employment. A calculation of difference between these two items provided a measure of future employment needs. Table I reports the number of workers employed by the sample of agricultural supplies and services businesses.

TABLE I EMPLOYMENT TREND
N = 41

Year	Employment
1976	414
1981	484

Trend = +3.2%

The expansion rate factor of 3.2% is the average annual compound rate which will account for the sample's growth. The same procedure was used on actual 1971 and 1976 employment data to determine a historical employment trend.

TABLE II HISTORICAL TREND

Year	Employment
1972	14,206
1976	16,117

Trend = +3.3%

A comparison of the past and future employment trend indicates that the total employment in agricultural supplies and services businesses will continue to increase, but at a slower rate.

The next step was to determine the total employment for each of the five years of projection for the study. The future employment trend of 3.2 is an annual growth rate for the five year period. A formula which considers the trend and scope of employment change was used to determine total employment projections.

TABLE III PROJECTIONS 1977-81

Year	% Change	Total Employment	Expansion Employment
1977	+3.2	16,633	516
1978	+3.2	17,165	532
1979	+3.2	17,714	549
1980	+3.2	18,281	567
1981	+3.2	18,866	585

The change rate was the basis for determining employment projections. Table IV summarizes the projected employment within the major areas of Indiana's agricultural supply and services businesses.

TABLE IV

EMPLOYMENT IN AGRICULTURAL SUPPLIES AND SERVICES BUSINESSES

*Code		1972 Businesses	1972 Employees	1976 Businesses	1976 Employees	1981 Businesses	1981 Employees
071	Soil Preparation Services			15	16	15	20
072	Crop Services			35	96	40	130
074	Vet Services	321	1,332	316	1,433	350	1850
075	Animal Services			71	229	80	326
076	Farm Management Services			9	55	12	75
352	Farm and Garden Stores	79	5,918	79	5,801	79	5636
515	Wholesale Farm Materials	545	6,956	588	8,547	638	10829
Totals Agricultural Supplies and Services		945	14,206	1113	16,177	1215	18866
Average Numbers of Employees per Business			15.03		14.53		15.53

*Standard Industrial Classification Codes

II. Determining the employment needs of agricultural supplies and services businesses

In addition to expansion labor needs, jobs created by retirement and employee turnover were determined.

The study asked each business to indicate the number of employees who were hired to replace workers. This data was collected for 1971, 1976 and 1981. An average annual replacement employment needs rate was calculated by dividing average 1971, 1976 and 1981 employment by 1971, 1976 and 1981 average replacement workers.

The average annual employee replacement rate for agricultural supplies and services businesses was 10.3%. Industry mobility was determined by applying the state average employee retirement rate (3.64).[1]

TABLE V REPLACEMENT EMPLOYMENT

Year	Total Employment	Total Replacement Needs	Industry Mobility	Net Replacement Needs
1977	16633	1713	1108	605
1978	17165	1768	1143	625
1979	17714	1825	1180	645
1980	18281	1883	1218	665
1981	18866	1943	1258	685

Yearly employment needs were determined by summing net replacement needs and annual expansion.

[1] 3.64% is the 1976 average retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

TABLE VI EMPLOYMENT NEEDS

Year	Total Employment	Expansion Employment	Net Replacement Needs	Annual Employment
1977	16633	516	605	1121
1978	17165	532	625	1157
1979	17714	549	645	1194
1980	18281	567	665	1232
1981	18866	585	685	1270

Table VI reports the projected employment needs for agricultural supplies and services businesses. The table shows that due to expansion alone, this industry will hire an average of 550 additional employees in each of the next five years. After counting workers to replace retirements, the agricultural supplies and services industry is projected to have an annual employment need of between 1121 and 1270 workers.

III. Determining agricultural supplies and services businesses' employee training needs

In addition to projecting the number of agribusiness workers, the study determined the industries' need for employees with agricultural experience at the high school and college level.

Businesses were asked to list the number of employees who needed agricultural experience in each of the seven non-farm areas of vocational agriculture. Table VII reports the number and percentage of employees in agricultural supplies and services businesses who need agricultural experience at the high school and college level.

TABLE VII EMPLOYEES NEEDING AGRICULTURAL EXPERIENCE

	1976 N = 414	1981 N = 484
High School	344 (83%)	392 (81%)
College	58 (14%)	73 (15%)
Totals	402 (97%)	465 (96%)

Table VII answers the question: How many agricultural supply and service employees need agricultural experience? Currently 97% of agricultural supplies and services business employees need agricultural experience. In addition to determining the total number needing agricultural experience, a breakdown of high school and college employees was completed. The 1981 data shows a small shift toward an industry need for more college level agriculturally trained employees.

Next, the study developed a detailed listing of the specialized experience needs of agricultural workers.

Table VIII reports the specialized experience needs of agricultural supply and service employees.

Table VIII answers the question: What kind of experiences in agriculture do agricultural supply and service employees need? This result represents a training need profile for employees in agricultural supplies and services businesses. The profile together with the projected total employment need was used to identify the demand for graduates of agricultural personnel preparation programs.

Table IX lists the specialized preparation and the annual agricultural employment needs of agricultural supply and service businesses.

During each year 1977-1981, agricultural supply and service businesses will need 800 to 900 high school level and approximately 200 college level agricultural workers. Table IX addressed the questions of what kind and how many agricultural employees will be needed by Indiana's agricultural supply and service businesses.

Table IX also reported that nearly one-half of the agricultural supply and service businesses' agricultural employment demand was for personnel with agricultural experiences other than in agricultural supplies and services. For example, Table IX projected an annual demand for 100 high school level agricultural mechanics workers and 170 high school level agricultural products employees.

To provide an estimate of the personnel preparation

TABLE VIII

EMPLOYEE EXPERIENCE NEEDS

Training Area	Training Level	1976 (N=414)		1981 (N=484)	
Agricultural Supplies and Services	H.S.	236	(57%)	260	(54%)
	College	30	(7%)	39	(8%)
Agricultural Mechanics	H.S.	28	(7%)	37	(8%)
	College	6	(1%)	6	(1%)
Agricultural Products	H.S.	51	(12%)	64	(13%)
	College	11	(3%)	12	(2%)
Ornamental Horticulture	H.S.	8	(2%)	8	(2%)
	College	0	0	0	0
Agricultural Resources	H.S.	4	(1%)	4	(1%)
	College	4	(1%)	4	(1%)
Forestry	H.S.	0	0	0	0
	College	0	0	0	0
Other Agriculture	H.S.	17	(4%)	20	(4%)
	College	7	(2%)	11	(2%)
HIGH SCHOOL TOTALS		344	(83%)	393	(81%)
COLLEGE TOTALS		58	(14%)	72	(15%)
ANNUAL TOTALS		402	(97%)	465	(96%)

TABLE IX

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	500	510	520	530	540
	College	112	114	116	118	120
Agricultural Mechanics	H.S.	109	111	113	115	117
	College	11	11	11	11	11
Agricultural Products	H.S.	166	169	172	175	178
	College	17	18	19	20	21
Ornamental Horticulture	H.S.	21	21	21	21	21
	College	0	0	0	0	0
Agricultural Resources	H.S.	11	11	11	11	11
	College	11	11	11	11	11
Forestry	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Other Agriculture	H.S.	42	43	44	45	46
	College	21	21	21	21	21
HIGH SCHOOL TOTALS		849	866	883	900	917
COLLEGE TOTALS		193	196	199	202	205
ANNUAL TOTALS		1042	1062	1082	1102	1122

TABLE X

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE
IN AGRICULTURAL SUPPLIES AND SERVICES

Business Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	500	510	520	530	540
	College	112	114	116	118	120
Agricultural Mechanics	H.S.	190	190	190	190	190
	College	67	67	67	67	67
Agricultural Products	H.S.	3	3	3	3	3
	College	0	0	0	0	0
Ornamental Horticulture	H.S.	16	16	16	16	16
	College	5	5	5	5	5
Agricultural Resources	H.S.	1	1	1	1	1
	College	10	10	11	11	11
Forestry	H.S.	376	380	384	389	394
	College	25	25	25	26	26
HIGH SCHOOL TOTALS		1086	1100	1114	1129	1144
COLLEGE TOTALS		219	221	224	227	229
ANNUAL TOTALS		1305	1321	1338	1356	1373

demand for high school agricultural supplies and services programs, Table X was developed. Table X summarized the agricultural supplies and services worker needs from each agribusiness area in Indiana.

Table X reports that by 1981 Indiana's agribusinesses will demand 1144 high school and 229 college prepared agricultural supply and service workers.

EMPLOYMENT NEEDS DATA
FOR
AGRICULTURAL PRODUCTS BUSINESSES

1. Determining the total employment in agricultural products businesses

Employment projections are based on:

1) The estimates of future employment made by businesses participating in the study.

2) Current and historical employment data.

3) The trend established from historical present and future data.

The questionnaire used in this study asked each business to "List the total number of persons you expect will be employed in the year 1981." The results of this question were compared to the businesses' current employment. A calculation of difference between these two items provided a measure of future employment needs. Table I reports the number of workers employed by the sample of agricultural products businesses.

TABLE I EMPLOYMENT TREND
N = 77

Year	Employment
1976	11,432
1981	12,648

Trend = +2.0%

The expansion rate factor of 2.0% is the average annual compound rate which will account for the sample's growth. The same procedure was used on actual 1971 and 1976 employment data to determine a historical employment trend.

TABLE II HISTORICAL TREND

Year	Employment
1972	86,507
1976	91,935

A comparison of the past and future employment trend indicates that the total employment in agricultural products businesses will continue to increase.

The next step was to determine the total employment for each of the five years of projection for the study. The future employment trend of 2.0% is an annual growth rate for the five-year period. A formula which considers the trend and scope of employment change was used to determine total employment projections.

TABLE III PROJECTIONS 1977-81

Year	% Change	Total Employment	Expansion Employment
1977	2.0	93,774	1,839
1978	2.0	95,649	1,875
1979	2.0	97,562	1.913
1980	2.0	99,513	1,951
1981	2.0	101,504	1,991

The change rate was the basis for determining employment projections. Table IV summarizes the projected employment within the major areas of Indiana's agricultural products businesses.

TABLE IV

EMPLOYMENT IN AGRICULTURAL PRODUCTS BUSINESSES

*Code		1972 Businesses	1972 Employees	1976 Businesses	1976 Employees	1981 Businesses	1981 Employees
201	Meat Processing	149	8,394	154	8,111	174	7,838
202	Dairy Processing	131	5,073	78	3,990	65	3,139
203	Preserved Fruits & Vegetables	69	5,086	64	5,139	60	5,209
204	Grain Mill Products	65	3,770	63	4,278	62	5,013
205	Bakery Products	63	4,875	78	4,461	89	4,082
206	Sugar Products	12	1,345	13	1,192	15	1,056
207	Fats & Oil Processing	20	1,835	22	1,684	24	1,545
209	Other Food Preparation	59	3,099	55	2,311	53	1,724
4222	Food Storage	20	525	25	564	32	619
514	Wholesale Farm Products	681	9,297	719	10,652	810	12,610
54	Retail Food Stores	2,378	43,208	2,505	49,553	2,860	58,737
Totals Agricultural Products		3,647	86,907	3,927	91,935	4,245	101,504
Average Numbers of Employees per Businesses		23.83		23.411		23.91	

*Standard Industrial Classification Codes

II. Determining the employment needs of agricultural products businesses

In addition to expansion labor needs, jobs created by retirement and employee turnover were determined.

The study asked each business to indicate the number of employees who were hired to replace workers. This data was collected for 1971, 1976 and 1981. An average annual replacement employment needs rate was calculated by dividing average 1971, 1976 and 1981 employment by 1971, 1976 and 1981 average replacement workers.

The average annual employee replacement rate for agricultural products businesses was 10.6%. Industry mobility was determined by applying the state average employee retirement rate (3.64%).[1]

TABLE V REPLACEMENT EMPLOYMENT

Year	Total Employment	Total Replacement Needs	Industry Mobility	Net Replacement Needs
1977	93774	9940	6527	3413
1978	95649	10139	6657	3482
1979	97562	10342	6791	3551
1980	99513	10548	6926	3622
1981	101504	10759	7064	3695

Yearly employment needs were determined by summing net replacement needs and annual expansion.

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[1] 3.64% is the 1976 average retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

TABLE VI EMPLOYMENT NEEDS

Year	Total Employment	Expansion Employment	Net Replacement Needs	Annual Employment
1977	93774	1839	3413	5252
1978	95649	1875	3482	5357
1979	97562	1913	3551	5464
1980	99513	1951	3622	5573
1981	101504	1991	3695	5686

Table VI reports the projected employment needs for agricultural products businesses. The table shows that due to expansion alone, this industry will hire an average of 1900 additional employees in each of the next five years. After counting workers to replace retirements, the agricultural products businesses are projected to have an annual employment need of between 5252 and 5685 workers.

III. Determining agricultural products businesses' employee training needs

In addition to projecting the number of agribusiness workers, the study determined the industries' need for employees with agricultural experience at the high school and college level.

Businesses were asked to list the number of employees who needed agricultural experience in each of the seven non-farm areas of vocational agriculture. Table VII reports the number and percentage of employees in agricultural products businesses who need agricultural experience at the high school and college level.

TABLE VII EMPLOYEES NEEDING AGRICULTURAL EXPERIENCE

	1976 N = 11432		1981 N = 12648	
High School	452	(4%)	515	(4%)
College	58	(1%)	72	(1%)
Totals	510	(5%)	587	(5%)

Table VII answers the question: How many agricultural products business employees need agricultural experience? Currently 5% of agricultural products business employees need agricultural experience. In addition to determining the total number needing agricultural experience, a breakdown of high school and college employees was completed. The 1981 data shows similar industry labor needs for 1976 and 1981.

Next, the study developed a detailed listing of the specialized experience needs of agricultural workers. Table VII reports the specialized experience needs of

agricultural products business employees.

Table VIII answers the question: What kind of experiences in agriculture do agricultural products employees need? This result represents a training need profile for employees in agricultural products businesses. The profile together with the projected total employment need were used to identify the demand for graduates of agricultural personnel preparation programs.

Table IX lists the specialized preparation and the annual agricultural employment needs of agricultural products businesses.

During each year 1977-1981, agricultural products businesses will need 235 to 247 high school level and approximately forty college level agricultural workers. Table IX addressed the questions of what kind and how many agricultural employees will be needed by Indiana's agricultural products businesses.

Table IX also reported that only 24% of the agricultural products businesses' agricultural employment demand was for personnel with agricultural experiences other than in agricultural products. For example, in 1980 Table IX projects an annual demand for twenty-nine high school level ornamental horticulture workers and fourteen high school level agricultural mechanics employees.

To provide an estimate of the personnel preparation demand for high school agricultural products programs,

TABLE VIII

EMPLOYEE EXPERIENCE NEEDS

Training Area	Training Level	1976 (N=11432)		1981 (N+12648)	
Agricultural Supplies and Services	H.S.	6	(<1%)	6	(<1%)
	College	0	0	1	(<1%)
Agricultural Mechanics	H.S.	10	(<1%)	17	(<1%)
	College	0	0	2	(<1%)
Agricultural Products	H.S.	402	(4%)	442	(3%)
	College	53	(<1%)	60	(<1%)
Ornamental Horticulture	H.S.	14	(<1%)	29	(<1%)
	College	2	(<1%)	6	(<1%)
Agricultural Resources	H.S.	1	(<1%)	1	(<1%)
	College	0	0	0	0
Forestry	H.S.	0	0	0	0
	College	0	0	0	0
Other Agriculture	H.S.	19	(<1%)	20	(<1%)
	College	3	(<1%)	3	(<1%)
HIGH SCHOOL TOTALS		452	(4%)	515	(4%)
COLLEGE TOTALS		58	(<1%)	72	(<1%)
ANNUAL TOTALS		510	(5%)	587	(5%)

TABLE IX

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	3	3	3	3	3
	College	0	0	0	0	0
Agricultural Mechanics	H.S.	14	14	14	14	14
	College	0	0	0	0	0
Agricultural Products	H.S.	181	184	187	190	193
	College	26	27	28	29	30
Ornamental Horticulture	H.S.	29	29	29	29	29
	College	9	9	9	9	9
Agricultural Resources	H.S.	1	1	1	1	1
	College	0	0	0	0	0
Forestry	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Other Agriculture	H.S.	7	7	7	7	7
	College	2	2	2	2	2
HIGH SCHOOL TOTALS		235	238	241	244	247
COLLEGE TOTALS		37	38	39	40	41
ANNUAL TOTALS		272	276	280	284	288

TABLE X

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE
IN AGRICULTURAL PRODUCTS

Business Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	166	169	172	175	178
	College	17	18	19	20	21
Agricultural Mechanics	H.S.	43	42	42	42	41
	College	14	16	18	20	20
Agricultural Products	H.S.	181	184	187	190	193
	College	26	27	28	29	30
Ornamental Horticulture	H.S.	46	47	48	49	50
	College	6	6	6	6	6
Agricultural Resources	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Forestry	H.S.	22	24	25	26	28
	College	41	41	41	41	41
HIGH SCHOOL TOTALS		458	466	474	482	490
COLLEGE TOTLAS		92	108	112	116	118
ANNUAL TOTALS		550	574	596	598	608

Table X was developed. Table X summarized the agricultural products worker needs from each agribusiness area in Indiana.

Table X reports that by 1981, Indiana's agribusinesses will demand 247 high school and forty-one college prepared agricultural products workers.

EMPLOYMENT NEEDS DATA
FOR
ORNAMENTAL HORTICULTURE BUSINESSES

I. Determining the total employment in ornamental horticulture businesses.

Employment projections are based on:

1) The estimates of future employment made by businesses participating in the study.

2) Current and historical employment data.

3) The trend established from historical present and future data.

The questionnaire used in this study asked each business to "List the total number of persons you expect will be employed in the year 1981." The results of this question were compared to the businesses' current employment. A calculation of difference between these two items provided a measure of future employment needs. Table I reports the number of workers employed by the sample of ornamental horticulture businesses.

TABLE I EMPLOYMENT TREND
N = 59

Year	Employment
1976	512
1981	589

Trend = +2.8%

The expansion rate factor of 2.8% is the average annual compound rate which will account for the sample's growth. The same procedure was used on actual 1971 and 1976 employment data to determine a historical employment trend.

TABLE II HISTORICAL TREND

Year	Employment
1976	6,730
1972	5,815

Trend = +3.0%

A comparison of the past and future employment trend indicates that the total employment in ornamental horticulture businesses will continue to increase at the same rate.

The next step was to determine the total employment for each of the five years of projection for the study. The future employment trend of 3.0% is an annual growth rate for the five-year period. A formula which considers the trend and scope of employment change was used to determine total employment projections.

TABLE III PROJECTIONS 1977-81

Year	% Change	Total Employment	Expansion Employment
1977	3.0	6,938	208
1978	3.0	7,152	214
1979	3.0	7,372	220
1980	3.0	7,598	226
1981	3.0	7,830	232

The change rate was the basis for determining employment projections. Table IV summarizes the projected employment within the major areas of Indiana's ornamental horticulture businesses.

TABLE IV

EMPLOYMENT IN ORNAMENTAL HORTICULTURE BUSINESSES

*Code		1972 Businesses	1972 Employees	1976 Businesses	1976 Employees	1981 Businesses	1981 Employees
018	Horticultural Production Specialists	90	973	116	1311	126	1684
078	Landscape & Horticultural Services	196	963	325	1553	409	2159
526	Lawn & Garden Stores	210	1409	214	1258	216	1123
5992[1]	Florists	455	2470	468	2608	478	2764
Totals Ornamental Horticulture		1053	5815	1121	6730	1227	7730
Average Numbers of Employees per Business			5.52		6.00		6.30

(1) 1972 data for 5992 code was incomplete; 1972 estimate is based on partial data

* Standard Industrial Classification Codes

II. Determining the employment needs of ornamental horticulture businesses

In addition to expansion labor needs, jobs created by retirement and employee turnover were determined.

The study asked each business to indicate the number of employees who were hired to replace workers. This data was collected for 1971, 1976 and 1981. An average annual replacement employment needs rate was calculated by dividing average 1971, 1976 and 1981 employment by 1971, 1976 and 1981 average replacement workers.

The average annual employee replacement rate for ornamental horticulture businesses was 12.2%. Industry mobility was determined by applying the state average employee retirement rate (3.64%).[1]

TABLE V REPLACEMENT EMPLOYMENT

Year	Total Employment	Total Replacement Needs	Industry Mobility	Net Replacement Needs
1977	6938	630	380	252
1978	7152	649	389	260
1979	7372	667	400	267
1980	7598	685	411	274
1981	7830	703	422	281

Yearly employment needs were determined by summing net replacement needs and annual expansion.

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[1] 3.64% is the average employee retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

TABLE VI EMPLOYMENT NEEDS

Year	Total Employment	Employment	Net Replacement Needs	Annual Employment
1977	6928	208	244	452
1978	7152	214	246	460
1979	7372	220	247	467
1980	7598	226	248	474
1981	7830	232	249	481

Table VI reports the projected employment needs for ornamental horticulture businesses. The table shows that due to expansion alone, this industry will hire an average of 220 employees in each of the next five years. After counting workers to replace retirements, ornamental horticulture businesses are projected to have an annual employment need of between 452 and 481 workers.

III. Determining ornamental horticulture businesses' employee training needs

In addition to projecting the number of agribusiness workers, the study determined the industries' need for employees with agricultural experience at the high school and college level.

Businesses were asked to list the number of employees who needed agricultural experience in each of the seven non-farm areas of vocational agriculture. Table VII reports the number and percentage of employees in ornamental horticulture businesses who need agricultural experience at the high school and college level.

TABLE VII EMPLOYEES NEEDING AGRICULTURAL EXPERIENCE

	1976 N = 512	1981 N = 589
High School	276 (54%)	323 (55%)
College	50 (10%)	65 (11%)
Totals	326 (64%)	388 (66%)

Table VII answers the question: How many ornamental horticulture business employees need agricultural experience? Currently 64% of ornamental horticulture businesses' employees need agricultural experience. In addition to determining the total number needing agricultural experience, a breakdown of high school and college employees was completed. The 1981 data shows a small shift towards an industry need for a greater percentage of both high school and college level employees.

Next, the study developed a detailed listing of the specialized experience needs of agricultural workers. Table VIII reports the specialized experience needs of ornamental horticulture employees.

Table VIII answers the question: What kind of experiences in agriculture do ornamental horticulture employees need? This result represents a training need profile for employees in ornamental horticulture businesses. The profile together with the projected total employment need was used to identify the demand for graduates of agricultural personnel preparation programs.

Table IX lists the specialized preparation and the annual agricultural employment needs of ornamental horticulture businesses.

During each year 1977-1981, ornamental horticulture businesses will need 237 to 253 high school level and approximately sixty-five college level agricultural workers. Table IX addressed the questions of what kind and how many agricultural employees will be needed by Indiana's ornamental horticulture businesses.

Table IX also reported that nearly one-third of the ornamental horticulture businesses' agricultural employment demand was for personnel with agricultural experiences other than in ornamental horticulture. For example, Table IX projects an annual demand for eleven high school level agricultural mechanics workers and sixteen high school level agricultural supplies and services employees.

TABLE VIII

EMPLOYEE EXPERIENCE NEEDS

Training Area	Training Level	1976 (N=512)		1981 (N=589)	
Agricultural Supplies and Services	H.S.	43	(8%)	41	(7%)
	College	10	(2%)	10	(2%)
Agricultural Mechanics	H.S.	7	(1%)	10	(2%)
	College	2	(<1%)	2	(<1%)
Agricultural Products	H.S.	44	(9%)	54	(9%)
	College	6	(1%)	7	(1%)
Ornamental Horticulture	H.S.	159	(31%)	188	(32%)
	College	26	(5%)	40	(7%)
Agricultural Resources	H.S.	0	0	0	0
	College	0	0	0	0
Forestry	H.S.	0	0	0	0
	College	2	(<1%)	0	0
Other Agriculture	H.S.	23	(4%)	30	(5%)
	College	4	(1%)	6	(1%)
HIGH SCHOOL TOTALS		276	(54%)	323	(55%)
COLLEGE TOTALS		50	(10%)	65	(11%)
ANNUAL TOTALS		326	(64%)	388	(66%)

TABLE IX

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	16	16	16	16	16
	College	5	5	5	5	5
Agricultural Mechantcs	H.S.	11	11	11	11	11
	College	0	0	0	0	0
Agricultural Products	H.S.	46	47	48	49	50
	College	6	6	6	6	6
Ornamental Horticulture	H.S.	153	156	159	162	165
	College	49	50	51	52	53
Agricultural Resources	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Forestry	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Other Agriculture	H.S.	11	11	11	11	11
	College	2	2	2	2	2
HIGH SCHOOL TOTALS		237	241	245	249	253
COLLEGE TOTALS		62	63	64	65	66
ANNUAL TOTALS		299	304	309	314	319

TABLE X

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE
IN ORNAMENTAL HORTICULTURE

Business Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	21	21	21	21	21
	College	0	0	0	0	0
Agricultural Mechanics	H.S.	16	16	16	16	16
	College	0	0	0	0	0
Agricultural Products	H.S.	29	29	29	29	29
	College	9	9	9	9	9
Ornamental Horticulture	H.S.	153	156	159	162	165
	College	49	50	51	52	53
Agricultural Resources	H.S.	12	13	13	13	14
	College	6	6	7	7	7
Forestry	H.S.	0	0	0	0	0
	College	0	0	0	0	0
HIGH SCHOOL TOTALS		231	235	238	241	245
COLLEGE TOTALS		64	65	67	68	69
ANNUAL TOTALS		295	300	305	309	314

To provide an estimate of the personnel preparation demand for high school ornamental horticulture programs, Table X was developed. Table X summarized the ornamental horticulture worker needs from each agribusiness industry in Indiana.

Table X reports that by 1981, Indiana's agribusinesses will demand 245 high school and sixty-nine college prepared ornamental horticulture workers.

EMPLOYMENT NEEDS DATA
FOR
AGRICULTURAL RESOURCES BUSINESSES

I. Determining the total employment in agricultural resources businesses

Employment projections are based on:

1) The estimates of future employment made by businesses participating in the study.

2) Current and historical employment data.

3) The trend established from historical present and future data.

The questionnaire used in this study asked each business to "List the total number of persons you expect will employed in the year 1981." The results of this question were compared to the businesses' current employment. A calculation of difference between these two items provided a measure of future employment needs. Table I reports the number of workers employed by the sample of agricultural resources businesses.

TABLE I EMPLOYMENT TREND
N = 13

Year	Employment
1976	81
1981	88

Trend = +1.7%

The expansion rate factor of 1.7% is the average annual compound rate which will account for the sample's growth. The same procedure was used on actual 1971 and 1976

employment data to determine a historical employment trend.

TABLE II HISTORICAL TREND

Year	Employment
1972	1099
1976	1259

Trend = +2.6%

A comparison of the past and future employment trend indicates that the total employment in agricultural resources businesses will continue to increase but at a slower rate.

The next step was to determine the total agricultural resource business employment for each of the five years of projection for the study. The future employment trend of 1.8% is an overall growth rate for the five-year period. A formula which considers the trend and scope of employment change was used to determine total employment projections.

TABLE III PROJECTIONS 1977-81

Year	% Change	Total Employment	Expansion Employment
1977	+1.7	1,280	21
1978	+1.7	1,302	22
1979	+1.7	1,324	22
1980	+1.7	1,347	23
1981	+1.7	1,370	23

The change rate was the basis for determining employment projections. Table IV summarizes the projected employment within the major areas of Indiana's agricultural resources businesses.

TABLE IV

EMPLOYMENT IN AGRICULTURAL RESOURCES BUSINESSES

*Code		1972[1] Businesses	1972[1] Employees	1976 Businesses	1976 Employees	1981 Business	1981 Employees
703	Camps and Trailering	76	253	115	272	145	285
7992	Public and Private Golf Courses	207	593	240	640	265	298
951	Environmental Quality	8	253	8	347	8	412
Totals Agricultural Resources		291	1099	363	1259	418	1370
Average Numbers of Employees per Business			3.78		3.47		3.28

(1) 1972 data for 703 and 951 was incomplete; 1972 estimates are based on partial data

* Standard Industrial Classification Codes

11. Determining the employment needs of agricultural resources businesses

In addition to expansion labor needs, jobs created by retirement and employee turnover were determined.

The study asked each business to report the number of employees who were hired to replace workers. This data was collected for 1971, 1976 and 1981. An average annual replacement employment needs rate was calculated by dividing average 1971, 1976 and 1981 employment by 1971, 1976 and 1981 average replacement workers.

The average annual employee replacement rate for agricultural resources businesses was 11.4%. Industry mobility was determined by applying the state average employee retirement rate (3.64%).[1]

TABLE V REPLACEMENT EMPLOYMENT

Year	Total Employment	Total Replacement Needs	Industry Mobility	Net Replacement Needs
1977	1280	141	94	47
1978	1302	148	100	48
1979	1324	151	103	48
1980	1347	154	105	49
1981	1370	156	106	50

Yearly employment needs were determined by summing net replacement needs and annual expansion.

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[1] 3.64% is the average employee retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

TABLE VI EMPLOYMENT NEEDS

Year	Total Employment	Expansion Employment	Net Replacement Needs	Annual Employment
1977	1280	21	47	68
1978	1302	22	48	70
1979	1324	22	48	70
1980	1347	23	49	72
1981	1370	23	50	73

Table VI reports the projected employment needs for agricultural resources businesses. The table shows that due to expansion alone, this industry will hire an additional twenty-one to twenty-three employees in each of the next five years. After counting workers to replace retirements, the agricultural resources industry is projected to have an annual employment need of between sixty-eight and seventy-three workers.

III. Determining agricultural resources businesses' employee training needs

In addition to projecting the number of agribusiness workers, the study determined the industries' need for employees with agricultural experience at the high school and college level.

Businesses were asked to list the number of employees who needed agricultural experience in each of the seven non-farm areas of vocational agriculture. Table VII reports resources businesses who need agricultural experience at the high school and college level.

TABLE VII EMPLOYEES NEEDING AGRICULTURAL EXPERIENCE

	1976 N = 81	1981 N = 88
High School	31 (38%)	33 (38%)
College	14 (17%)	23 (26%)
Totals	45 (55%)	56 (64%)

Table VII answers the question: How many agricultural resources business employees need agricultural experience? Currently 55% of agricultural resources business employees need agricultural experience. In addition to the total number needing agricultural experience, a breakdown of high school and college employees was completed. The 1981 data shows a shift toward an industry need for a greater proportion of college trained personnel.

Next, the study developed a detailed listing of the specialized experience needs of agricultural workers. Table VIII reports the specialized experience needs of

agricultural resources business employees.

Table VIII answers the question: What kind of experiences in agriculture do agricultural resources employees need? This result represents a training need profile for employees in agricultural resources businesses. The profile together with the projected total employment need was used to identify the demand for graduates of agricultural personnel preparation programs.

Table IX lists the specialized preparation and the annual agricultural employment needs of agricultural resource businesses.

During each year 1977-1981, agricultural resources businesses will need twenty-five to thirty-one high school level and approximately thirty-five college level agricultural workers. Table IX addressed the questions of what kind and how many agricultural employees will be needed by Indiana's agricultural resources businesses.

Table IX also reported that nearly two thirds of the agricultural resources businesses' agricultural employment demand was for personnel with agricultural experiences other than in agricultural resources. For example, Table IX projects an annual demand for twelve to fourteen high school level horticulture workers and two to three high school level agricultural mechanics workers.

To provide an estimate of the personnel preparation demand for high school agricultural resources programs, Table X was developed. Table X summarized the agricultural

TABLE VIII

EMPLOYEE EXPERIENCE NEEDS

Training Area	Training Level	1976 (N=81)		1981 (N=88)	
Agricultural Supplies and Services	H.S.	1	(1%)	1	(1%)
	College	2	(3%)	5	(6%)
Agricultural Mechanics	H.S.	5	(6%)	5	(6%)
	College	0	0	1	(1%)
Agricultural Products	H.S.	0	0	0	0
	College	0	0	0	0
Ornamental Horticulture	H.S.	8	(10%)	10	(11%)
	College	6	(7%)	7	(8%)
Agricultural Resources	H.S.	12	(15%)	10	(11%)
	College	4	(5%)	5	(6%)
Forestry	H.S.	0	0	0	0
	College	1	(1%)	1	(1%)
Other Agriculture	H.S.	5	(6%)	7	(8%)
	College	1	(1%)	4	(5%)
HIGH SCHOOL TOTALS		31	(38%)	33	(38%)
COLLEGE TOTALS		14	(17%)	23	(26%)
ANNUAL TOTALS		45	(55%)	56	(64%)

TABLE IX

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	1	1	1	1	1
	College	10	10	11	11	11
Agricultural Mechanics	H.S.	2	2	3	3	3
	College	0	0	0	0	0
Agricultural Products	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Ornamental Horticulture	H.S.	12	13	13	13	14
	College	6	6	7	7	7
Agricultural Resources	H.S.	1	1	1	1	1
	College	5	5	6	6	6
Forestry	H.S.	0	0	0	0	0
	College	1	1	1	1	1
Other Agriculture	H.S.	8	9	9	9	10
	College	9	10	10	10	10
HIGH SCHOOL TOTALS		25	28	29	29	31
COLLEGE TOTALS		31	32	35	35	35
ANNUAL TOTALS		56	60	64	64	66

TABLE X

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE
IN AGRICULTURAL RESOURCES

Business Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	11	11	11	11	11
	College	11	11	11	11	11
Agricultural Mechanics	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Agricultural Products	H.S.	1	1	1	1	1
	College	0	0	0	0	0
Ornamental Horticulture	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Agricultural Resources	H.S.	1	1	1	1	1
	College	5	5	6	6	6
Forestry	H.S.	0	0	0	0	0
	College	0	0	0	0	0
HIGH SCHOOL TOTALS		13	13	13	13	13
COLLEGE TOTALS		16	16	17	17	17
ANNUAL TOTALS		29	29	30	30	30

resources worker needs from each agribusiness area in Indiana.

Table X reports that by 1981, Indiana's agribusinesses will demand thirteen high school and seventeen college prepared agricultural resources workers.

EMPLOYMENT NEEDS DATA
FOR
FORESTRY BUSINESSES

I. Determining the total employment in forestry businesses

Employment projections are based on:

1) The estimates of future employment made by businesses participating in the study.

2) Current and historical employment data.

3) The trend established from historical present and future data.

The questionnaire used in this study asked each business to "List the total number of persons you expect will be employed in the 1981." The results of this question were compared to the businesses' current employment. A calculation of difference between these two items provided a measure of future employment needs. Table I reports the number of workers employed by the sample of forestry businesses.

TABLE I EMPLOYMENT TREND
N = 33

Year	Employment
1976	482
1981	514

Trend = +1.2%

The expansion rate factor of 1.2% is the average annual compound rate which will account for the sample's growth. The same procedure was used on actual 1971 and 1976 employment data to determine a historical employment trend.

TABLE II HISTORICAL TREND

Year	Employment
1972	61,770
1976	64,292

A comparison of the past and future employment trend indicates that the total employment in forestry businesses will continue to increase at the one percent rate per year.

The next step was to determine the total employment for each of the five years of projection for the study. The future employment trend of 1.2% is an annual growth rate for the five-year period. A formula which considers the trend and scope of employment change was used to determine total employment projections.

TABLE III PROJECTIONS 1977-81

Year	% Change	Total Employment	Expansion Employment
1977	+1.2	65,064	772
1978	+1.2	65,844	780
1979	+1.2	66,634	790
1980	+1.2	67,434	800
1981	+1.2	68,243	809

The change rate was the basis for determining employment projections. Table IV summarizes the projected employment within the major areas of Indiana's forestry businesses.

TABLE IV

EMPLOYMENT IN FORESTRY BUSINESSES

*Code		1972 Businesses	1972 Employees	1976 Businesses	1976 Employees	1981 Businesses	1981 Employees
521	Lumber and Building Materials	720	7,515	752	8,142	784	8,642
525	Hardware Store	545	3,654	554	3,812	563	4,046
241(2)	Logging and Wood Products	432	12,203	416	12,466	400	13,234
242(2)	Vaneer and Plywood	432	7,259	416	7,890	400	8,375
243(2)	Furniture & Fixtures	432	17,358	416	17,463	400	18,536
244(2) 249(2)	Paper and Allied Products	432	13,781	416	14,518	400	15,410
Totals Forestry		1,697	61,770	1,722	64,292	1,747	68,243
Average Numbers of Employees per Business			36.40		37.34		38.88

* Standard Industrial Classification Codes

(2) Figures for these codes were taken from Research Bulletin No. 923, June 1975, Purdue University, Agriculture Experiement Station.

II. Determining the employment needs of forestry businesses

In addition to expansion labor needs, jobs created by retirement and employee turnover were determined.

The study asked each business to indicate the number of employees who were hired to replace workers. This data was collected for 1971, 1976 and 1981. An average annual replacement employment needs rate was calculated by dividing average 1971, 1976 and 1981 employment by 1971, 1976 and 1981 average replacement workers.

The average annual employee replacement rate for forestry businesses was 11.6%. Industry mobility was determined by applying the state average employee retirement rate (3.64%).[1]

TABLE V REPLACEMENT EMPLOYMENT

Year	Total Employment	Total Replacement Needs	Industry Mobility	Net Replacement Needs
1977	65064	6376	4008	2368
1978	65844	6453	4056	2397
1979	66634	6530	4105	2425
1980	67434	6609	4154	2455
1981	68243	6688	4204	2484

Yearly employment needs were determined by summing net replacement needs and annual expansion.

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[1] 3.64% is the 1976 average retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

TABLE VI EMPLOYMENT NEEDS

Year	Total Employment	Expansion Employment	Net Replacement Needs	Annual Employment
1977	65064	722	2368	3140
1978	65844	780	2397	3177
1979	66634	790	2425	3215
1980	67434	800	2455	3255
1981	68243	809	2484	3293

Table VI reports the projected employment needs for forestry businesses. The table shows that due to expansion alone, this industry will hire an average of 800 additional employees in each of the next five years. After counting workers to replace retirements, the forestry businesses are projected to have an annual employment need of between 3140 and 3293 workers.

III. Determining forestry employee training needs

In addition to projecting the number of agribusiness workers, the study determined the industries' need for employees with agricultural experience at the high school and college level.

Businesses were asked to list the number of employees who needed agricultural experience in each of the seven non-farm areas of vocational agriculture. Table VII reports the number and percentage of employees in forestry businesses who need agricultural experience at the high school and college level.

TABLE VII EMPLOYEES NEEDING AGRICULTURAL EXPERIENCE

	1976 N = 482	1981 N = 514
High School	151 (31%)	150 (29%)
College	14 (3%)	15 (3%)
Totals	165 (34%)	165 (32%)

Table VII answers the question: how many forestry employees need agricultural experience? Currently 34% of forestry business employees need agricultural experience. In addition to determining the total number needing agricultural experience, a breakdown of high school and college employees was completed. The 1981 data shows a small shift toward an industry need for fewer high school level employees.

Next, the study developed a detailed listing of the specialized experience needs of agricultural workers. Table VIII reports the specialized experience needs of

forestry business employees.

Table VIII answers the question: What kind of experiences in agriculture do forestry employees need? This result represents a training need profile for employees in forestry businesses. The profile together with the projected total employment need was used to identify the demand for graduates of agricultural personnel preparation programs.

Table IX lists the specialized preparation and the annual agricultural employment needs of forestry businesses.

During each year 1977-1981, forestry businesses will need 730 to 765 high school level and approximately 120 college level agricultural workers. Table IX addressed the questions of what kind and how many agricultural employees will be needed by Indiana's forestry businesses.

Table IX also reported that nearly seventy percent of the forestry businesses' agricultural employment demand was for personnel with agricultural experiences other than in forestry. For example, Table IX projects an annual demand for 376 to 394 high school agricultural supplies and services workers and 133 to 128 high school level agricultural mechanics.

To provide an estimate of the personnel preparation demand for high school forestry programs, Table X was developed. Table X summarized the forestry worker need from each agribusiness area in Indiana.

Table X reports that by 1981, Indiana's agribusinesses will demand 765 high school and 119 college prepared forestry workers.

TABLE VIII

EMPLOYEE EXPERIENCE NEEDS

Training Area	Training Level	1976 (N=482)		1981 (N=514)	
Agricultural Supplies and Services	H.S.	73	(15%)	74	(14%)
	College	1	(1%)	5	(1%)
Agricultural Mechanics	H.S.	27	(6%)	27	(5%)
	College	1	(<1%)	1	(<1%)
Agricultural Products	H.S.	26	(5%)	22	(4%)
	College	3	(1%)	4	(1%)
Ornamental Horticulture	H.S.	0	0	0	0
	College	0	0	0	0
Agricultural Resources	H.S.	0	0	0	0
	College	0	0	0	0
Forestry	H.S.	25	(5%)	28	(5%)
	College	4	(1%)	5	(1%)
Other Agriculture	H.S.	0	0	0	0
	College	1	(<1%)	0	0
HIGH SCHOOL TOTALS		151	(31%)	150	(29%)
COLLEGE TOTALS		14	(3%)	15	(3%)
ANNUAL TOTALS		165	(34%)	165	(32%)

TABLE IX

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE

Training Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	376	380	384	389	394
	College	25	25	25	26	26
Agricultural Mechanics	H.S.	133	134	135	137	138
	College	5	5	5	5	5
Agricultural Products	H.S.	22	24	25	26	28
	College	41	41	41	41	41
Ornamental Horticulture	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Agricultural Resources	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Forestry	H.S.	199	201	202	204	205
	College	46	46	46	47	47
Other Agriculture	H.S.	0	0	0	0	0
	College	0	0	0	0	0
HIGH SCHOOL TOTALS		730	739	746	756	765
COLLEGE TOTALS		117	117	117	119	119
ANNUAL TOTALS		847	856	863	875	884

TABLE X

ANNUAL NEED FOR EMPLOYEES WITH AGRICULTURAL EXPERIENCE IN FORESTRY

Business Area	Training Level	1977	1978	1979	1980	1981
Agricultural Supplies and Services	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Agricultural Mechanics	H.S.	18	18	18	18	18
	College	9	9	9	9	9
Agricultural Products	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Ornamental Horticulture	H.S.	0	0	0	0	0
	College	0	0	0	0	0
Agricultural Resources	H.S.	0	0	0	0	0
	College	1	1	1	1	1
Forestry	H.S.	199	201	202	204	205
	College	46	46	46	47	47
HIGH SCHOOL TOTALS		217	219	220	222	223
COLLEGE TOTALS		56	56	56	57	57
ANNUAL TOTALS		273	275	276	279	280

EMPLOYMENT NEEDS DATA
FOR
AGRICULTURAL PRODUCTION

I. Declining farm numbers

This section reports the labor needs of Indiana's farms. Farm production in Indiana and across the nation is being accomplished each year by a declining proportion of the total work force. In 1960 for example, 8.7%[1] of the nation's population lived on farms; by 1976 this percentage was reduced to 3.9.[1] In 1960 218,000[2] workers were employed full-time on Indiana farms; by 1976 the number of full-time farm workers was 127,000[2]. This trend toward fewer full-time farm workers is continuing but at a slower rate. Table I reports a steady decline of Indiana full-time workers. Figure I illustrates the rate of decline of full-time farm workers.

Two other important patterns are part of today's Indiana farm labor picture. The number of full-time hired farm workers is increasing and the number of part-time farm workers is growing.

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(1) Handbook of Agricultural Charts 1976, Agricultural Handbook No. 504, U.S. Department of Agriculture, Washington, D.C. 20250

(2) Annual Crop and Livestock Summary, 1975, Statistical Reporting Service, Bulletin A76-1, U.S. Department of Agriculture, Washington, D.C. 20250

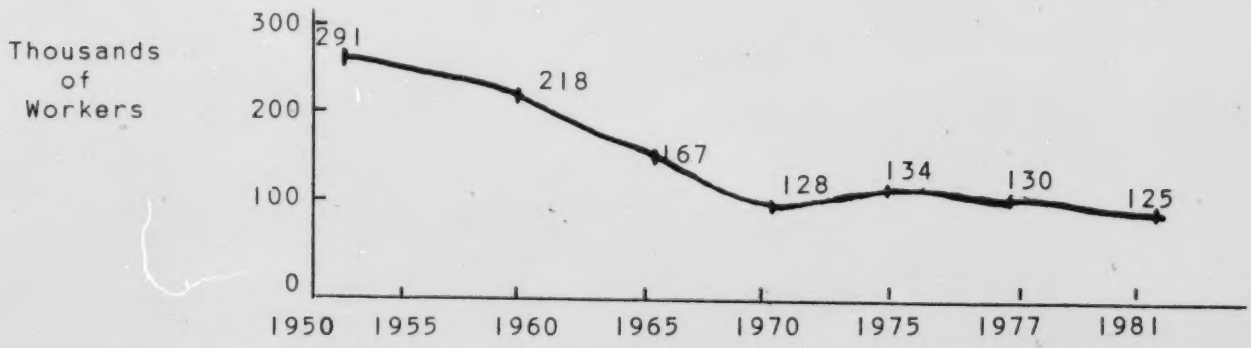
TABLE I

WORKERS ON INDIANA FARMS

Year	Total Workers
1960	218,000
1965	167,000
1970	128,000
1971	134,000
1972	142,000
1973	143,000
1974	142,000
1975	134,000
1976	127,000
1981	125,000

FIGURE I

ANNUAL AVERAGE FULL-TIME FARM WORKERS IN INDIANA 1950-1981*



* 1977-1981 estimates

II. An increasing number of full-time hired farm workers

The hired farm labor trend in Indiana is not consistent with the national pattern. Hired labor data for the United States show a decline in the number of hired farm workers. In 1960, there were 3.7 million[1] hired farm laborers in the United States, by 1970 2.8 million and in 1975 2.7 million. In Indiana a reverse from the national trend has occurred. Table II reports that in 1965 there was an annual average of 10,000[2] hired farm workers, by 1970 12,000 and by 1975 this number had grown to 27,000. Figure II illustrates this trend and projects future numbers of hired farm workers.

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[1] Ibid, No. 1.

[2] Ibid, No. 2.

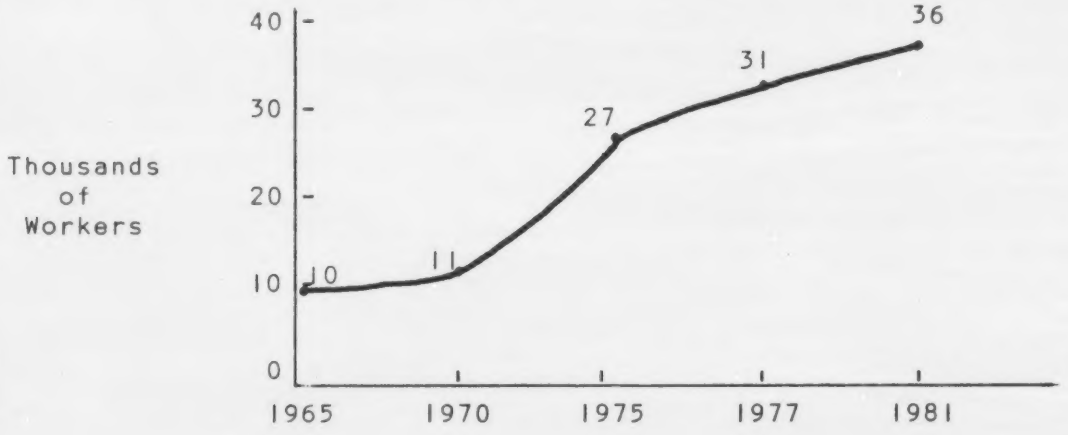
TABLE II

HIRED WORKERS ON INDIANA FARMS

Year	Hired Farm Workers
1965	10,000
1969	11,000
1970	11,000
1971	12,000
1972	13,000
1973	13,000
1974	16,000
1975	27,000
1976	29,000
1981	36,000

FIGURE II

AVERAGE ANNUAL HIRED FARM WORKERS IN INDIANA 1965-1981*



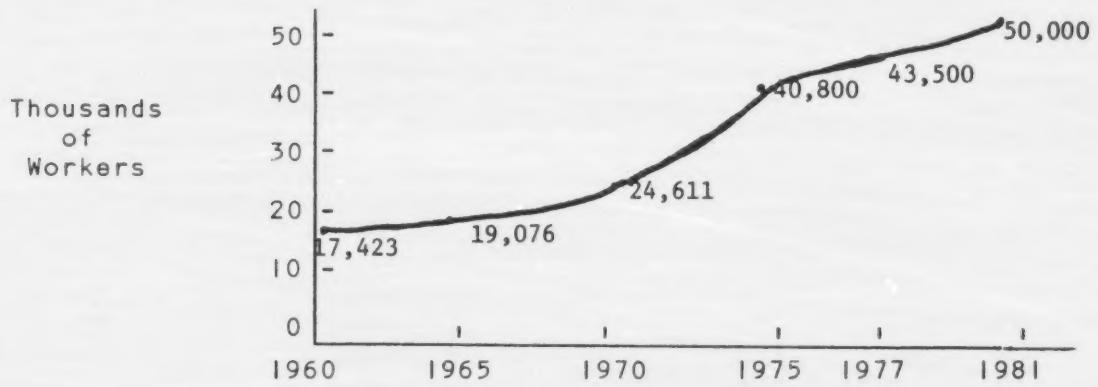
*1977-1981 are estimates

III. A growing number of part-time farms

The number of part-time farmers in Indiana has increased dramatically between each of the past four agricultural census periods. An agricultural census is taken at five year intervals. The most recent census year is 1974. The 1959 agricultural census reported 17,423[(1)] part-time farmers in Indiana. A part-time farmer is a farm worker whose principle occupation is other than farming. Figure III[(1)] reports part-time farmer numbers from the four most recent agricultural censuses. Based on this data from the past fifteen years, Figure III projects 1977 and 1981 estimates of the number of part-time farmers.

FIGURE III

PART-TIME FARM WORKERS IN INDIANA 1960-1981*



*1977-1981 estimates

(1) Part-time farmer data is taken from the 1959, 1964, 1969 and 1974 agricultural census.

IV. Projecting labor needs on Indiana farms

Projections of future labor needs for Indiana farms are based on the historical trends of farm labor. The number of family farm workers is expected to continue to decline. The number of full-time hired farm workers is expected to continue to increase. Also, the number of part-time farmers is expected to increase. The scope of change within each of these three farm labor catagories is the basis for estimating the total labor needs of Indiana's farms for the years 1977-1981.

First, the labor needs of family farm workers were considered. The full-time farm worker figures for Indiana, Table I and Figure I, were reduced by the number of full-time hired farm workers, Table II and Figure II. This result called "Family Farm Workers" is presented in Table IV. Figure IV illustrates a "bump" in the long time historical trend toward fewer family farm workers. This short time "bump" (increase) in family farm workers which occurred in the early 1970's is attributed to the end of government farm production controls and to a world-wide food shortage. Excepting future interruptions such as occurred in the early 1970's, the trend toward fewer family farm workers is expected to continue.

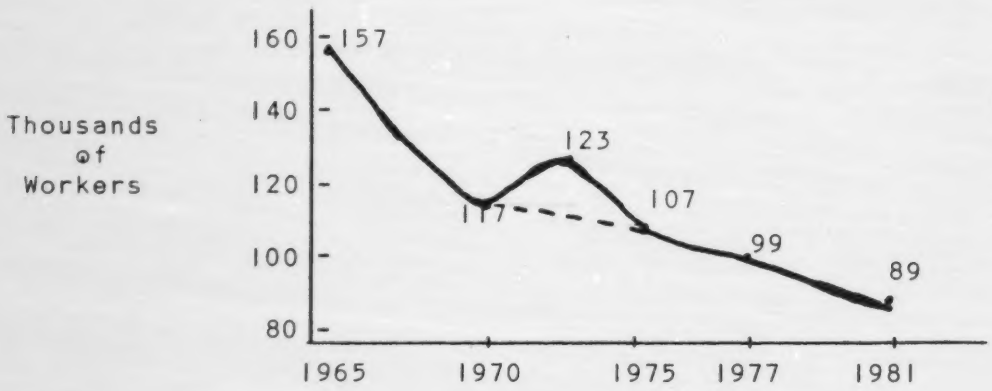
TABLE IV

AVERAGE ANNUAL FAMILY FARM WORKERS (IN THOUSANDS)

Year	Total Farm Workers	Hired Farm Workers	Family Farm Workers
1965	167	10	157
1970	128	11	117
1975	134	27	107
1977	130	31	99
1981	125	36	89

FIGURE IV

AVERAGE ANNUAL FAMILY FARM WORKERS 1965-1981*



*1977-1981 are estimates

The annual number of family farm workers needed to maintain the estimated future worker levels of Table IV was determined. Annual family farm worker replacement needs were based on the average age of farm workers. In 1974, the average age of full-time family farm workers was 51.8[1]. Based on the assumption that the average family farm worker will retire by age seventy, 3000 farm workers will retire each year 1977-1981. Table IV's estimates of 99,000 1977 farm workers and 89,000 by 1981 illustrates an annual negative growth of 2000 farm workers. Combination of retirement needs and negative growth results in an annual need for 1000 full-time family farm workers.

Table II and Figure II estimates of future increased need for full-time hired workers represents an annual demand for 1000 workers. Estimating hired worker replacement at 3.64%[2] represents an annual demand for approximately 1125 farm workers. Table V reports an annual full-time farm labor need for 3125 workers each year 1977-1981.

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(1) 1974 Census of Agriculture, Preliminary Report Indiana, U.S. Department of Commerce, AG 74-P-18-000, September 1976, Washington, D.C. 20233.

(2) 3.64% is the 1976 average retirement rate as reported by the Indiana Employment Security Office, Research Division, Indianapolis, Indiana.

TABLE V

1977-1981 FULL-TIME FARM LABOR NEEDS

	Workers Needed
Family farm worker retirement	+3000
Decline in family farm workers	-2000
Hired farm worker retirement	+1125
Increase in hired farm worker	+1000
Full-time farm labor needs	+3125

V. Consideration of Indiana's part-time farmers

Part-time farm worker needs have traditionally not received consideration as employment opportunities for students enrolled in vocational agriculture programs. Due to the increasing numbers of part-time farmers in Indiana, this study undertook the task of determining the production and labor used by part-time farmers. The county task force committees of thirteen of the project's sample counties identified 104 "typical" part-time farmers. Information from ninety of the sample of 104 part-time Indiana farmers is reported in Tables VI and VIII. Table VI indicates that today's part-time farmer is producing farm products at the rate of full-time farmers of the 1950's[1]. Table VII reports that part-time farmers plan to increase labor use about 10% by 1981.

Tables VI and VIII provide evidence of substantial production and plans for continued production on Indiana's part-time farms. Part-time farmer numbers are expected to increase at the rate of 1300 per year. The

[1] State Summary, 1950 Farm Business Summary, Agricultural Economics Department, Purdue University, Cooperative Extension Department, West Lafayette, Indiana.

TABLE VI

PART I FARM DESCRIPTION (AS THE FARM IS TODAY)

Total acres 155 Tillable acres 107

List the size of the major livestock and crop enterprises on your farm.

Crops	Acres			Livestock
Corn - Grain	58	Beef	8	number of cows 2 years or older
Corn - Silage	2	Dairy	<1	number of milk cows
Hay	15	Swine	6	number of litters farrowed in 1976
Soybeans	22	Chickens	<10	number of 1 year or older
Wheat	10	Sheep	2	number of ewes lambed 1976
Others (list)		Feeder Cattle	12	number of cattle finished 1976
	0	Feeder Pigs	47	number of pigs finished 1976
		Others (list)	0	

TABLE VII

PART II FARM LABOR NEEDS

For each category of labor of farm labor used on your farm, estimate the number of hours of work needed to operate the farm for each year, 1971, 1976 and 1981.

(Example) If you own and operate a part time beef/cash crop farm, and in 1976 will spend on the average of 2 hours with it each day, multiply 2 times 365 which equals 730 hours of work. The number 730 is then entered as the amount of owner/operator labor needed for 1976. Similarly, if a nonpaid member of the family worked 3 hours per week, 3 times 52 equals 156 hours of labor. The number 156 is then entered as unpaid family labor.

	1971	1976	1981
Owner/operator	578	618	702
Owner/not operator	<10	<10	<10
Manager/not owner	0	0	0
Paid skilled labor	30	56	49
Paid unskilled labor	70	99	140
Unpaid family labor	193	311	292
Number of 10 hour days of labor needed	88	109	119

annual replacement of 3.64% of current part-time farmer numbers requires 1585 part-time farmers per year. The estimated number of part-time farmers needed to meet the projections of future part-time farmers is 2885 per year for 1977-1981.

The tables on the previous page report the average of responses by the sample of Indiana part-time farmers. Table VI lists the livestock and crops produced while Table VII reports the 1971, 1976 and 1981 labor needs. Table VII labor needs are detailed by six common types of labor sources used on farms. The average number of ten hour days of labor used on this sample of Indiana part-time farms is 109. This indicates that these farms need or use about one-half the yearly labor of a full-time worker.

Summary

To meet the labor needs of farm production, vocational agriculture program planners need to be continually aware of the trends of farm labor needs. Traditional farm production classes are designed to prepare farm youth to operate the family farm. The trends toward fewer full-time family farm workers, more full-time hired farm workers and an increasing number of part-time farmers may require new approaches in vocational agriculture programs. To meet the vocational education needs of tomorrow's production agriculture labor force it is recommended that, (1) further efforts be directed toward determining the vocational education needs of each of the three groups of farm workers and (2) strategies or models which are effective in preparing non-farm youth for farm production jobs need to be developed.

Results

The results of the Procedural Model for Employment Needs Assessment are presented on the following Tables A through E. This set of five tables reports the high school level worker needs of Indiana's agribusinesses for each year 1977 through 1981. These tables report employment need data for each vocational agricultural program area recognized by the United States Office of Education. For example, Table A, 1977 data, reports a total agribusiness industry need for 1086 high school level agricultural supplies and service workers. Five hundred of these workers will be needed by agricultural supply and services businesses, 190 by agricultural mechanics businesses, three by agricultural products businesses, 16 by ornamental horticulture businesses, 376 by forestry businesses and one by agricultural resource businesses.

Table A also reports a 1977 need for 3125 full-time farm workers and 2885 part-time farm workers.

TABLE A

1977
TOTAL AGRIBUSINESS EMPLOYMENT NEEDS
for
HIGH SCHOOL LEVEL WORKERS

High School Vocational Program Areas

Business Area	Agricultural Supplies & Services	Agricultural Mechanics	Agricultural Products	Ornamental Horticulture	Forestry	Agricultural Resources
Agricultural Supplies & Services	500	109	166	21	0	11
Agricultural Mechanics	190	488	43	16	18	0
Agricultural Products	3	14	181	29	0	1
Ornamental Horticulture	16	11	46	153	0	0
Forestry	376	133	22	0	199	0
Agricultural Resources	1	2	0	12	0	1
TOTALS	1086	757	458	231	217	13
Agricultural Production	Part-Time 2885 Full-Time 3125					

1977 Total Need for Full-Time High School Level Employees - 5887

TABLE B

1978
TOTAL AGRIBUSINESS EMPLOYMENT NEEDS
for
HIGH SCHOOL LEVEL WORKERS

High School Vocational Program Areas

Business Area	Agricultural Supplies & Services	Agricultural Mechanics	Agricultural Products	Ornamental Horticulture	Forestry	Agricultural Resources
Agricultural Supplies & Services	510	111	169	21	0	11
Agricultural Mechanics	190	486	42	16	18	0
Agricultural Products	3	14	184	29	0	1
Ornamental Horticulture	16	11	47	156	0	0
Forestry	380	134	24	0	201	1
Agricultural Resources	1	2	0	13	0	0
TOTALS	1100	758	466	235	219	13

Agricultural Production	Part-Time 2885 Full-Time 3125

1978 Total Need for Full-Time High School Employees - 5916

TABLE C

1979
TOTAL AGRIBUSINESS EMPLOYMENT NEEDS
for
HIGH SCHOOL LEVEL WORKERS

High School Vocational Program Areas

Business Area	Agricultural Supplies & Services	Agricultural Mechanics	Agricultural Products	Ornamental Horticulture	Forestry	Agricultural Resources
Agricultural Supplies & Services	520	113	172	21	0	11
Agricultural Mechanics	190	484	42	16	18	0
Agricultural Products	3	14	187	29	0	1
Ornamental Horticulture	16	11	48	159	0	0
Forestry	384	135	25	0	202	1
Agricultural Resources	1	3	0	13	0	0
TOTALS	1114	760	474	238	220	13

Agricultural Production	Part-time 2885 Full-Time 3125

1979 Total Need for Full-Time High School Level Employees - 5944

TABLE D

1980
TOTAL AGRIBUSINESS EMPLOYMENT NEEDS
for
HIGH SCHOOL LEVEL WORKERS

High School Vocational Program Areas

Business Area	Agricultural Supplies & Services	Agricultural Mechanics	Agricultural Products	Ornamental Horticulture	Forestry	Agricultural Resources
Agricultural Supplies & Services	530	115	175	21	0	11
Agricultural Mechanics	190	482	42	16	18	0
Agricultural Products	3	14	190	29	0	1
Ornamental Horticulture	16	11	49	162	0	0
Forestry	389	137	26	0	204	1
Agricultural Resources	1	3	0	13	0	0
TOTALS	1129	762	482	241	222	13

Agricultural Production	Part-Time 2885 Full-Time 3125

1980 Total Need for Full-Time High School Level Employees - 5974

TABLE E

1981
TOTAL AGRIBUSINESS EMPLOYMENT NEEDS
for
HIGH SCHOOL LEVEL WORKERS

High School Vocational Program Areas

Business Area	Agricultural Supplies & Services	Agricultural Mechanics	Agricultural Products	Ornamental Horticulture	Forestry	Agricultural Resources
Agricultural Supplies & Services	540	117	178	21	0	11
Agricultural Mechanics	190	480	41	16	18	0
Agricultural Products	3	14	193	29	0	1
Ornamental Horticulture	16	11	50	165	0	0
Forestry	394	138	0	0	205	1
Agricultural Resources	1	3	28	14	0	0
TOTALS	1144	763	490	245	223	13

Agricultural Production	Part-Time 2885 Full-Time 3125

1981 Total Need for Full-Time High School Level Workers - 6003

CHAPTER IV

FINDINGS AND RECOMMENDATIONS

Employment needs information is an essential element to providing effective vocational education for today's youth. Without it, vocational education assumes the risk of preparing students for work in industries which lack employment potential. Where are future jobs? This is an important question. The data presented in the previous chapter provides current and future agribusiness job opportunity information.

This research project also developed and tested the procedures which provided employment information for Indiana's agribusinesses. The importance of the procedural model lies in both its uniqueness and its ability to make a substantial contribution to the development of vocational education programs in agriculture.

Findings

The procedural model based upon the random sample of agribusinesses did provide access to agribusiness employment data. The model validation tests indicated that the stratification procedures used did contribute to the selection of a representative random sample of agribusinesses. The specific results of the procedural model tests are presented in chapter II. This section also lists the critical aspects of the model.

Chapter III reports the agribusiness employment needs

by vocational agriculture program areas. The results portray agribusinesses, with the exception of full-time farmers, as continuing to be growth industries. Expansion employment hiring is anticipated for each of the non-farm business areas of agriculture.

Recommendations

The scope of Chapter III's data indicates that Indiana vocational agriculture education programs should plan major program emphasis for the preparation of workers for production agriculture, agricultural supplies and services, agricultural mechanics, agricultural products, and ornamental horticulture.

Recommendations for planning vocational programs can best be made only when both demand and supply data are available. This report has accomplished a major step toward providing meaningful job demand data for vocational program planning in agriculture. Continued efforts must be made in providing the valid supply data. Vocational agriculture departments need help in reporting unduplicated enrollment data by USOE occupational code numbers. These authors perceive many "programs" within a vocational agriculture department are not, in reality, programs, but simply a class or classes. In many cases the "class" does not lead to an identifiable occupation and employment. Thus, reporting of these enrollments by the specific program area misleads program planners at all levels. These enrollments thus inflate the supply data for certain occupational areas and inflate other areas. The potential problem

is manifested in vocational agriculture due in part to the interrelatedness of the major occupational areas.

Based upon worker demand data, it is recommended that continuing efforts be made to vocationally prepare production agriculture, agricultural mechanics, and ornamental horticulture workers at the high school level.

Increased and/or new efforts are recommended toward the development and establishment of agricultural supplies and services, agricultural products and forestry as major instructional areas in high school vocational programs in Indiana.

BIBLIOGRAPHY

Agan, R.J. "Kansas Studies Agriculture Nonfarm Occupations." Agricultural Education Magazine, 37:15-16. July, 1964.

Annual Crop and Livestock Summary, 1975, Statistical Reporting Service, Bulletin A76-1. U.S. Department of Agriculture, Washington, D.C. 20250.

Barwich, Ralph P. Identification of Off-Farm Agriculture Occupations and the Education Needed for Employment in These Occupations in Delaware. Doctor's Thesis. University Park, Pennsylvania State University, 1965. 195 pages.

Brum, Herbert Duane. Non-Farm Agriculture Employment Opportunities and Training Needs in Ohio. Doctor's Thesis. Columbus: The Ohio State University, 1965.

Bureau of The Census, 1969 Census of Agriculture. United States Department of Commerce, Social and Economic Statistics Administration, Washington, D.C. March 1972.

Bureau of The Census, 1974 Census of Agriculture Preliminary Reports. United States Department of Commerce, Social and Economic Statistics Administration, Washington, D.C. September 1976.

Cook, Desmond L. Program Evaluation and Review Technique Applications in Education. U.S. Department of Health Education and Welfare, Office of Education, Washington, D.C., 1966. 100 pages.

Coster, John K. and J.K. Dane. Research and Development Strategies in Agricultural Education for the Seventies. Center for Occupational Education, Occasional Paper No. 4, North Carolina State University at Raleigh, Raleigh, North Carolina, 1969.

Davis, John H. and Ray A. Goldberg. A Concept of Agribusiness. Harvard Business School, Division of Research, Boston, 1957. p.2.

Drake, William E. and F.K.T. Tom. "Entry Occupations in Off-Farm Agriculture - A Survey and Task Analysis of Entry Level Off-Farm Agricultural Occupations in New York State." Cornell University, Ithaca, New York, July 1968.

Drawbaugh, Charles C. "Conducting a State Occupational Needs Survey in Agri-Business, Natural Resources and Environmental Improvement." Journal of The American Association of Teacher Educators In Agriculture. Vol. 16, No. 1, pp. 1-6. March 1975.

ERS-570, Employment in Agricultural and Agribusiness Occupations, Economic Research Service, United States Department of Agriculture, Washington, D.C., August 1974.

ERS-575, Employment in Agricultural and Agribusiness Occupations, Economic Research Service, United States Department of Agriculture, Washington, D.C., October 1974.

Fields, Ralph. A Study of Occupational Opportunities and Training Needs for Youth for On-Farm Jobs in Selected Indiana Counties. Purdue University, West Lafayette, Indiana. January 1970.

Handbook of Agricultural Charts 1976, Agricultural Handbook No. 504, U.S. Department of Agriculture. Washington, D.C. 20250

Homer, James. Statewide Computerized Model for Determining Occupational Opportunities in Nebraska. Nebraska Research Coordinating Unit, July 1968.

Indiana Crop and Livestock Statistics, Annual Crop and Livestock Summary, 1975. United States Department of Agriculture, Washington, D.C.

Indiana's Interim Manpower Projections 1970-1980. State of Indiana Employment Security Division, Indianapolis, Indiana, November 1974.

Indiana Labor Market, Occupational Employment Statistics Program. Research and Statistics Section, Indiana Employment Security Division, Indianapolis, Indiana, October 1975.

Indiana Labor Supply and Demand. Indiana State Advisory Council for Vocational Education and Indiana Employment Security Division, Indianapolis, Indiana, 1976.

Indiana State Plan for Vocational Education. State Board of Vocational and Technical Education, Indianapolis, Indiana, Fiscal Years 1975, 1977.

Labor Market Identification Model. Procedure in Labor Market Planning for Vocational Education Programs of Columbia Junior College. Columbia, California, October 1974. 45 pages.

Loreen, C.O. Occupational Opportunities and Training Needs of Youth for Non-Farm Agricultural Jobs in Washington State. Staff Study. Pullman: Department of Agricultural Education, Washington State University, 1967.

Maney, Thomas J. and Linda Boyd. A Pilot Research Project to Determine the Feasibility of Developing Health Related Occupations Curricula at Nicolet College and Technical Institute. Final Report. August 1974.

Mannebach, Alfred J. "A Survey of Community Resources and Employment Opportunities Having Implications for Programs of Vocational Agriculture." Journal of the American Association of Teacher Educators in Agriculture. Vol. 16, No. 1, pp. 13-17. March 1975.

McCrea, Joan. "The College Student's Occupational Outlook." Rocky Mountain Social Science Journal. Vol. II, No. 3, pp. 27-36. October 1974.

Minnesota, Agribusiness Employment Opportunities and Training Needs, The Vocational Division, State Department of Education, Room 545, Capitol Square, 550 Cedar Street, St. Paul, Minnesota, March 1973.

Montana State University, Agri-production Manpower Project Manual, Agricultural Education Department, Montana State University, Bozeman, Montana, July 1972.

Moore, Eddie A. Summary of Research - Agribusiness and Natural Resources in Michigan. Manpower Needs, Competencies Needed, School Program Characteristics, Michigan Department of Education, Vocational-Technical Education Service, Michigan State University, East Lansing, Michigan, June 1976.

Robertson, Marvin J. Utilizing Manpower and Follow-up Data: A Perspective for Local Vocational Education Planning. ERIC Clearinghouse on Vocational and Technical Education, The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, 1973.

Rosenthal, Neal and Hall Dillon. "Occupational Outlook for the Mid-1980's." Occupational Outlook Quarterly. Vol. 18, No. 4, pp. 2-11.

Standard Industrial Classification Manual. Office of Statistical Standards, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 1971.

State Summary, 1950 Farm Business Summary, Agricultural Economics Department, Purdue University, Cooperative Extension Department, West Lafayette, Indiana.

Theoe, Donald E. "Employment for 1975 Forestry Graduates." Journal of Forestry. Society of American Foresters, Washington, D.C., March 1976. pp. 165-168.

Thompson, O.E. Education in Agriculture in California. Research Report, College of Agricultural and Environmental Sciences, Davis, California, August 1971.

Trivett, David A. Jobs and College Graduates. ERIC Higher Education Research Currents, November 1975. 5 pages.

Tucker, Katie D. and James R. Rowell, Jr. A Model for a Statewide System for Community Occupational Needs Assessment. Gainsville, Florida. November 1974. 11 pages.

Vocational Education 1975-1976. State of Indiana, State Advisory Council on Vocational Education, Indianapolis, Indiana, 46204.

APPENDIX A

LIST OF AGRIBUSINESSES

by

STANDARD INDUSTRIAL CLASSIFICATION CODE

LIST OF AGRIBUSINESSES
by
STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE

Using Standard Industrial Classification Codes

Establishments are classified by types of activities in which they are engaged (according to primary activity). Data measures of activity include value of product, revenues, sales or payroll.

The SIC Classification system is comprised of three stages, as shown by these examples of SIC Classification for agriculture.

(a) two digit classification of major enterprise areas
(i.e.) 20 Food Products
(b) three digit sub-classification of major areas
(i.e.) 204 Grain Mill Products
(c) four digit speciality classification of sub areas
(i.e.) 2041 Flour Milling

There are agricultural specialty enterprise classifications under nearly every major two digit enterprise.

(i.e.) 0181 Horticulture Specialists
085 Forestry Services
074 Veterinary Services
202 Dairy Products
203 Canned & Processed Fruits & Vegetables
287 Agricultural Chemicals
3523 Farm Machinery and Equipment
515 Wholesale Farm Products
6131 Agricultural Audit Institutions
703 Campsites and Trailering Parks
7992 Public Golf Courses
8699 Membership Organizations (Farm Bureau & Grange)
9512 Wildlife & Forest Conservation (SCS Office)

LIST OF SIC CODES
by
AGRIBUSINESS PROGRAM AREAS

Agricultural Supplies and Services

07	Animal Services, Crop and Farm Business Services
287	Agricultural Chemicals
5191	Farm Supplies, Wholesale and Retail
6131	Other Agricultural Audit Services
73	Business Services - Grain Inspection
869	Professional Farm Organizations
964	Governmental Agricultural Services

Agricultural Mechanics

352	Farm Equipment Sales and Services
5083	Wholesale Farm Equipment Sales and Services
3551	Farm Equipment Production

Ornamental Horticulture

018	Landscaping, Gardening, and Tree Care Services
526	Retail Nurseries, Lawn and Garden Stores
5992	Retail Florists Shops

Forestry

08	Timber Tracts and Forestry Services
24	Lumber and Wood Products
261	Lumber and Wood Products
521	Agricultural Construction Specialists
525	Lumber and Building Sales

Agricultural Resources

09	Fishing, Hunting, and Trapping
703	Camps, Trailering, Outdoor Recreation
7992	Public Golf Courses
7997	Private Golf Courses
951	Governmental Environmental Agencies

Agricultural Products

20	Food Processors
4221	Farm Product Storage - Cold Storage
4222	Farm Product Storage
514	Wholesale Food Products
515	Farm Products Raw Materials
54	Retail Food Stores

APPENDIX B

LETTER TO OBTAIN ACCESS
TO S.I.C. INFORMATION

August 13, 1976

Mrs. Emily Hawk
Indiana Employment Security
Room 313
Indianapolis, Indiana 46204

Dear Mrs. Hawk:

This letter is to request assistance from the Employment Security Office in providing information which will be used in the Agribusiness Employment Needs Project. This project is funded by the State Board of Vocational and Technical Education and Purdue University.

Project Description. The Agribusiness Employment Needs Project is being conducted to identify the types of businesses which employ workers who are required to have had agricultural experience. The study will also determine the number of employees these businesses anticipate hiring in the next five years. The study will be a survey using mailed questionnaires and personal interviews. A copy of the project's abstract is attached for your information.

Information Needed.

1. Names of Agribusinesses for the fourteen survey counties. These counties are: Lake, Elkhart, Huntington, Grant, Fountain, Vermillion, Marion, Monroe, Bartholomew, Jefferson, Martin, Crawford, and Union.

In accordance with our discussion of August 6, we will obtain this information from the county business lists in your office. The SIC Codes we plan to include are:

017, 018, 07, 08, 092, 097, 20, 24, 261, 287, 352, 3551, 4221, 4222, 5083, 514, 515, 5191, 521, 525, 526, 54, 5992, 613, 73, 703, 7992, 7997, 869, 964, 951.

2. Address labels for selected businesses. Upon our selection of a sample of Agribusinesses, we ask for a listing of these business names and addresses on mailing labels. We will replace the amount of address label paper which is needed for this purpose. If possible we would like three copies of these labels.

Purpose and Use for Information. Lists of individual establishments will be used to identify a selected sample of businesses. The address labels will be needed to facilitate our mailing and interview follow-up of the project's questionnaire.

Use of this information will be limited to the Purdue research team and its county task force committees. No individual establishments will be identified in the project publications.

This sharing of information between two Indiana state agencies is sincerely appreciated.

Thank you for your consideration in this matter.

Sincerely,

James W. Legacy, PhD
Assistant Professor
Agricultural Education

enclosure

JWL:bd

APPENDIX C

SURVEY QUESTIONNAIRES

CONFIDENTIAL

Agricultural Education
Department of Education
Purdue University
West Lafayette, Indiana 47907

PRELIMINARY INFORMATION

Name _____ County Number _____

If you prefer a telephone interview to substitute for the following questionnaire, please return the following information to us: telephone number, name of person to call, and the preferred day and time to call.

Telephone: area code ___ number ____ person to call _____

Date and time to call _____

PART I FARM DESCRIPTION (AS THE FARM IS TODAY)

Total acres _____ Tillable acres _____

List the size of the major livestock and crop enterprises on your farm.

Crops	Acres	Livestock		
Corn - Grain	___	Beef	___	number of cows 2 years or older
Corn - Silage	___	Dairy	___	number of milk cows
Hay	___	Swine	___	number of litters farrowed in 1976
Soybeans	___	Chickens	___	number of 1 year or older
Wheat	___	Sheep	___	number of ewes lambed 1976
Others (list)		Feeder Cattle	___	number of cattle finished 1976
		Feeder Pigs	___	number of pigs finished 1976
_____	___	Others (list)		
_____	___			
_____	___	_____	___	number of _____
_____	___	_____	___	number of _____

PART II FARM LABOR NEEDS

For each category of labor of farm labor, used on your farm, estimate the number of hours of work needed to operate the farm for each year, 1971, 1976 and 1981.

(Example) If you own and operate a part time beef/cash crop farm, and in 1976 will spend on the average of 2 hours with it each day, multiply 2 times 365 which equals 730 hours or work. The number 730 is then entered as the amount of owner/operator labor needed for 1976. Similarly, if a nonpaid member of the family worked 3 hours per week, 3 times 52 equals 156 hours of labor. The number 156 is then entered as unpaid family labor.

	1971	1976	1981
Owner/operator	___	___	___
Owner/not operator	___	___	___
Manager/not owner	___	___	___
Paid skilled labor	___	___	___
Paid unskilled labor	___	___	___
Unpaid family labor	___	___	___

FUTURE JOB INFORMATION FOR THE YEAR 1981

CODING ONLY

List the total number of persons you expect will be employed in the business in the year 1981 _____.

FIRST, CHECK (/) the agribusiness program area of areas which the businesses employees will need to have agricultural experiences with.

THEN, ENTER the number of jobs in the business which will require agricultural experience at the high school or college level.

EXAMPLE: The farm store expects to employ 30 persons by 1981. The same size Ag Products and supplies staff will be expanded by adding six Ag Mechanics jobs. Five will be high school level mechanics and one will be a person with some college who will supervise the new Ag equipment service operation. This sample business response is:

/ Ag Supplies/Services
High School 10 College 2

/ Ag Mechanics
High School 5 College 1

/ Ag Products/Processing
High School 8 College 0

___ Ag Supplies/Services (furnishing supplies or services to farmers)
High School ___ College ___

___ Ag Mechanics (sales or service of agricultural equipment)
High School ___ College ___

___ Ag Products (processing or marketing farm products)
High School ___ College ___

___ Ornamental Horticulture (production, processing or sales of horticultural plants)
High School ___ College ___

___ Ag Resources (production or management of wildlife, outdoor recreation, soil or water)
High School ___ College ___

___ Forestry (forest management, logging, wood product sales or processing)
High School ___ College ___

___ Other Agribusiness (specify _____)
High School ___ College ___

1	___	26	___
2	___	27	___
3	___	28	___
4	___	29	___
5	___	30	___
6	___	31	___
7	___	32	___
8	___	33	___
9	___	34	___
10	___	35	___
11	___	36	___
12	___	37	___
13	___	38	___
14	___	39	___
15	___	40	___
16	___	41	___
17	___	42	___
18	___	43	___
19	___	44	___
20	___	45	___
21	___	46	___
22	___	47	___
23	___	48	___
24	___	49	___
25	___	50	___

Please list the number of current employees you would replace if persons with Agribusiness training were available. _____

CONFIDENTIAL
AGRICULTURAL EDUCATION
DEPARTMENT OF EDUCATION
PURDUE UNIVERSITY
WEST LAFAYETTE, IN 47907

PRELIMINARY INFORMATION

Business name (optional) _____

If you would prefer a telephone interview to substitute for the following questionnaire, please return the following information to us. Telephone number, name of person to call, and the prefered day and time to call. Telephone: area code ___ number _____ contact person _____ date and time to call _____

CODING ONLY

1	___	36	___
2	___	37	___
3	___	38	___
4	___	39	___
5	___	40	___
6	___	41	___
7	___	42	___
8	___	43	___
9	___	44	___
10	___	45	___
11	___	46	___
12	___	47	___
13	___	48	___
14	___	49	___
15	___	50	___
16	___	51	___
17	___	52	___
18	___	53	___
19	___	54	___
20	___	55	___
21	___	56	___
22	___	57	___
23	___	58	___
24	___	59	___
25	___	60	___
26	___	61	___
27	___	62	___
28	___	63	___
29	___	64	___
30	___	65	___
31	___	66	___
32	___	67	___
33	___	68	___
34	___	69	___
35	___	70	___

CURRENT JOB INFORMATION

List the total number of persons currently employed in the business _____.

FIRST, CHECK (/) the agribusiness program area or areas which the businesses employees need to have agricultural experience.

THEN, ENTER the number of jobs in the business which require agricultural experience at the high school or college level.

EXAMPLE: A farm store employs 24 persons. 10 need high school and 2 need college experience in the area of Ag Supplies/Services while 8 need a high school Ag Products experience and 4 do not need agribusiness experience. This business response is:

/ Ag Supplies/Services
High School 10 College 2

/ Ag Products/Processing
High School 8 College 0

___ Ag Supplies/Services (furnishing supplies or services to farmers)
High School ___ College ___

___ Ag Mechanics (sales or service of agricultural equipment)
High School ___ College ___

___ Ag Products (processing or marketing farm products)
High School ___ College ___

___ Ornamental Horticulture (production, processing or sales of horticultural plants)
High School ___ College ___

___ Ag Resources (production or management of wildlife, outdoor recreation, soil or water)
High School ___ College ___

___ Forestry (forest management, logging, wood product sales processing or building)
High School ___ College ___

___ Other Agribusiness (specify _____)
High School ___ College ___

REASONS FOR HIRING NEW AGRIBUSINESS EMPLOYEES*

How many agribusiness employees* were hired due to retirement or worker turnover in 1971 & 1976?
1971 ____
1976 ____

How many agribusiness employees* were hired due to business expansion in 1971 & 1976?
1971 ____
1976 ____

How many agribusiness employees* do you expect to hire due to retirement or turnover in 1981
1981 ____

How many agribusiness employees* do you expect to hire in 1981 due to business expansion?
1981 ____

*An agribusiness employee is defined as a person you hire who is required to have had agricultural experience in at least one of the six areas of agribusiness such as Ag Mechanics, etc.

APPENDIX D

QUESTIONNAIRES, COVER LETTER and FOLLOW-UP LETTERS

PURDUE UNIVERSITY

ASSESSMENT OF EMPLOYMENT NEEDS IN PRODUCTION AGRICULTURE AND AGRIBUSINESS FIRMS IN INDIANA

To: Elkhart County Agri-Businesses

From: Michael R. Jewett

Mike Jewett
Extension Agent
Elkhart County Agricultural
Extension Service

Leon Dean

Leon Dean
Vo Ag Instructor
Elkhart Area Career Center

John Lawrence
Agri-Businessman

We need your help! We have been asked to assist the Agricultural Education Section at Purdue University in identifying the employment needs in production agriculture and agri-business firms in Elkhart County. You have been selected to participate by taking a few minutes to answer the enclosed questionnaire. Your assistance is very important and your name will be kept confidential.

The information provided by you will be of great value in determining the types of jobs available and the number of students needed by occupations in production agriculture and agri-business firms in Elkhart County. As a result of this information, high schools will be able to develop plans for vocational agriculture programs based on our community needs. We are sure that you share our concern that our education programs in Elkhart County prepare our young people for today's jobs.

Enclosed please find a bicentennial sticker as a token of our appreciation for your assistance.

Agricultural Education
Building G, South Campus Courts
West Lafayette, Indiana 47907
(317) 749-2093

PURDUE UNIVERSITY

ASSESSMENT OF EMPLOYMENT NEEDS IN PRODUCTION AGRICULTURE AND AGRIBUSINESS FIRMS IN INDIANA

TO: Selected Indiana Farm Product Businesses

FROM: James W. Legacy

James W. Legacy
Visiting Professor
Agricultural Education
Purdue University

RE: A study determining the agricultural employment needs of Indiana Farm Product Businesses

You have recently received a letter from your county extension agent, agriculture teacher or an agri-businessman. They have asked for your participation in a statewide survey of the employment opportunities in farm product businesses for persons with experiences or training in agriculture. Initial response is good as we have received letters from every county and every business group selected.

To be confident with the results of the study, we are anxious to reach all of the businesses selected. Perhaps the initial letter to your business has been overlooked or misplaced. Enclosed is a duplicate set of materials including a stamped return addressed envelope.

Please take a few minutes to return the materials. If you have any questions concerning the study or the materials, feel free to contact the Agricultural Education Section at Purdue.

Telephone: (317) 749-2093

Agricultural Education
Building G, South Campus Courts
West Lafayette, Indiana 47907
(317) 749-2093

PURDUE UNIVERSITY

ASSESSMENT OF EMPLOYMENT NEEDS IN PRODUCTION AGRICULTURE AND AGRIBUSINESS FIRMS IN INDIANA

To: Selected Indiana Farmers

From: James W. Legacy

James W. Legacy
Visiting Professor
Agricultural Education
Purdue University

Re: A study determining the work time used to operate Indiana farms

We recently wrote to you soliciting your cooperation in a survey to determine the amount of work time Indiana farmers spend on the farm. Because we have not heard from you, we thought perhaps our initial letter had gone astray, or had been misplaced or overlooked. In view of this, we have enclosed a duplicate set of materials, including a stamped self-addressed return envelope for your convenience.

Please return the questionnaire whether you have information to report or not! If you have previously returned your questionnaire, please disregard this request.

Initial response is good as we have received letters from every county selected. To be confident with the results of the study, we are anxious to reach all of the farmers selected. Please take a few minutes to return the materials.

If you have any questions concerning the study or the materials, feel free to contact the Agricultural Education Section at Purdue.

Agricultural Education
Building G, South Campus Courts
West Lafayette, Indiana 47907
(317) 749-2093

PURDUE UNIVERSITY

ASSESSMENT OF EMPLOYMENT NEEDS IN PRODUCTION AGRICULTURE AND AGRIBUSINESS FIRMS IN INDIANA

URGENT!! URGENT!!

PLEASE READ CAREFULLY

The enclosed form contains questions that will provide information to use in planning vocational education programs in horticulture, forestry and lumber, agricultural mechanics, supplies and sales, processing and marketing. Your input is needed to give us an accurate picture of the employment trends of these and related industries.

This is the fourth mailing to obtain this information about your business. Since your business was selected at random, it is of great importance that we have, if possible, data relating to your business employment needs.

Please return the form even if none of your employees need special skills or knowledge of an agribusiness field.

Response to the first three mailings has been excellent from several business areas, for example 82% of 27 farm equipment businesses have returned the questionnaire.

We must soon tally the results. Won't you take time now to complete and return this information?

THE STUDENTS AND TEACHERS OF INDIANA'S VOCATIONAL EDUCATION PROGRAMS THANK YOU!!

James Legacy

Agricultural Education
Building G, South Campus Courts
West Lafayette, Indiana 47907
(317) 749-2093

APPENDIX E

URBAN DEMOGRAPHIC CLASSIFICATION of INDIANA'S 92 COUNTIES

COUNTY CLASSIFICATION DATA*

County	% Urban[1]	Total Pop. (thousands)	Class[2]	County	% Urban	Total Pop. (thousands)	Class
Adams	42	27	S	Franklin	19	17	R
Allen	80	280	U	Fulton	27	27	R
Bartholomew	40	58	S	Gibson	44	30	S
Benton	24	11	R	Grant	62	84	U
Blackford	53	16	S	Greene	30	27	R
Boone	32	31	R	Hamilton	40	55	S
Brown	0	9	R	Hancock	30	35	R
Carroll	15	18	R	Harrison	13	20	R
Cass	48	40	S	Hendricks	32	54	R
Clark	69	76	U	Henry	40	53	S
Clay	33	24	R	Howard	53	83	S
Clinton	49	31	S	Huntington	46	35	S
Crawford	0	8	R	Jackson	40	33	S
Daviess	43	27	S	Jasper	23	20	R
Dearborn	43	29	S	Jay	44	24	S
Decatur	38	23	S	Jefferson	60	27	U
DeKalb	39	31	S	Jennings	24	19	R
Delaware	70	129	U	Johnson	56	61	S
Dubois	43	31	S	Knox	57	42	S
Elkhart	63	127	U	Kosciusko	22	48	R
Fayette	67	26	U	Lagrange	0	21	R
Floyd	69	56	U	Lake	95	546	C
Fountain	38	18	S	LaPorte	66	105	U

(*) 1970 Census from 1970 Census of Population, U.S. Department of Commerce, Bureau of Census, 1973, Volume 1, Part 16, page 16-18, 16-19.

(1) Definition of Urban Population "all persons living in (a) places of 2500 inhabitants or more, incorporated but excluding those persons living in the rural portions of extended cities; (b) unincorporated places of 2500 inhabitants or more; (c) other territory within urban areas.

(2) C = City County; U = Urban County; S = Suburban County; R = Rural County

County	% Urban[1]	Total Pop. (thousands)	Class[2]	County	% Urban	Total Pop. (thousands)	Class
Lawrence	45	38	S	Rush	33	20	R
Madison	70	138	U	St. Joseph	85	245	U
Marion	99.8	792	C	Scott	57	17	S
Marshall	32	35	R	Shelby	40	38	S
Martin	27	11	R	Spencer	15	17	R
Miami	49	39	S	Starke	18	19	R
Monroe	61	85	U	Steuben	25	20	R
Montgomery	41	34	S	Sullivan	24	20	R
Morgan	35	44	S	Switzerland	0	6	R
Newton	0	12	R	Tippecanoe	72	109	U
Noble	32	31	R	Tipton	31	17	R
Ohio	0	4	R	Union	0	7	R
Orange	19	17	R	Vanderburgh	84	169	U
Owen	0	12	R	Vermillion	32	17	R
Parke	10	15	R	Vigo	71	115	U
Perry	42	19	S	Wabash	54	36	S
Pike	22	12	R	Warren	0	9	R
Porter	64	87	U	Warrick	21	28	R
Posey	31	22	R	Washington	26	19	R
Pulaski	0	13	R	Wayne	56	79	S
Putnam	33	27	R	Wells	35	24	S
Randolph	33	29	R	White	23	21	R
Tipley	16	21	R	Whitley	21	23	R

APPENDIX F

QUESTIONNAIRE CODING KEYS

Coding Key Employment Needs Project
(Farm Questionnaires)

Column	Item	Explanation
1-10	Identification	Card 2 Agribusiness Code Key
11-14	Total Acres	Actual Data
15-18	Tillable Acres	Actual Data
19-26	Crop Enterprises	Crop Range Key
27-36	Livestock Enterprises	Livestock Range Key
37-40	1971 TTL Labor Needs	Actual Data
41-46	1971 Labor Source	Labor Hours Range Key
47-50	1976 TTL Labor Needs	Actual Data
51-56	1976 Labor Source	Labor Hours Range Key
57-60	1981 TTL Labor Needs	Actual Data
61-66	1981 Labor Source	Labor Hours Range Key

Labor Hours Range Key

Code	Range
0	No Response
1	1 - 249
2	250 - 499
3	500 - 749
4	750 - 999
5	1000 - 1249
6	1250 - 1499
7	1500 - 1749
8	1750 - 1999
9	2000 - Plus

Crop Range Key

Code	Range
0	No Response
1	1 - 49
2	50 - 99
3	100 - 149
4	150 - 199
5	200 - 249
6	250 - 299
7	300 - 349
8	350 - 399
9	400 - Plus

Livestock Range Key

Code	Range
0	No Response
1	1 - 5
2	6 - 10
3	11 - 15
4	16 - 20
5	21 - 25
6	26 - 30
7	31 - 35
8	36 - 40
9	41 - Plus

100X for Poultry Numbers

Coding Key for Employment Needs Study

Card #1

Item	Column	Explanation
ID	1-10	(See Card Two)
Total Employed	11-14	
Ag Supplies	15	1 = yes 2 = no
AS HI	16-17	
AS CO	18-19	
Ag Mechanics	20	1 = yes 2 = no
AM HI	21-22	
AM CO	23-24	
Ag Product	25	1 = yes 2 = no
AP HI	26-27	
AM CO	28-29	
Ornamental Horticulture	30	1 = yes 2 = no
OH HI	31-32	
OH CO	33-34	
Ag Resources	35	1 = yes 2 = no
AR HI	36-37	
AR CO	38-39	
Forestry	40	1 = yes 2 = no
F HI	41-42	
F CO	43-44	
Other	45	1 = yes 2 = no
O HI	46-47	
O CO	48-49	
Retirement Hiring 1971	50-51	
1976	52-53	
1981	54-55	
Expansion Hiring 1971	56-57	
1976	58-59	
1981	60-61	
Future Job Information		
Total Employees	62-64	

Coding Key for Employment Needs Study

Card #2

Column	Item	Code Explanation
1	Respondent No.	Card 1 - Current job information & hiring reasons Card 2 - Future job information 001-199 Farmer 200-299 Ag Supplies & Services 300-399 Ag Mechanics 400-599 Ag Products 600-699 OH 700-799 Forestry & Ag Resources 800-899 Other Agribusiness
5-6	County ID no.	03 Bartholomew 08 Carroll 09 Cass 13 Crawford 20 Elkhart 26 Gibson 27 Grant 35 Huntington 39 Jefferson 45 Lake 49 Marion 53 Monroe 70 Rush 83 Vermillion
7-8	Business group no.	01 Farmers (less) 02 Farmers (more) 03 Landscapers 04 Florists 05 Golf Courses 06 Food Processors 07 Animal Services 08 Wholesale Farm Products 09 Farm Supplies 10 Farm Equipment 20 Gen. Lumber & Hardware 30 Retail Food Stores 40 50 60 70 80 90
9-10	Open	Open
11-14	Total Future Employment	Same columns and codes as card 1